



United States  
Department of  
Agriculture

Soil  
Conservation  
Service

In cooperation with  
University of Florida;  
Institute of Food and  
Agricultural Sciences;  
Agricultural Experiment  
Stations and Soil Science  
Department; and Florida  
Department of Agriculture  
and Consumer Services

# Soil Survey of Highlands County, Florida



# How To Use This Soil Survey

## General Soil Map

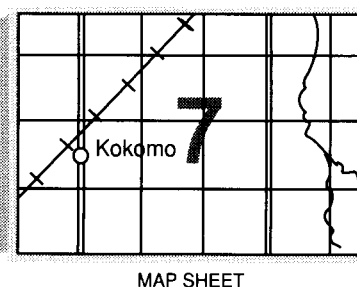
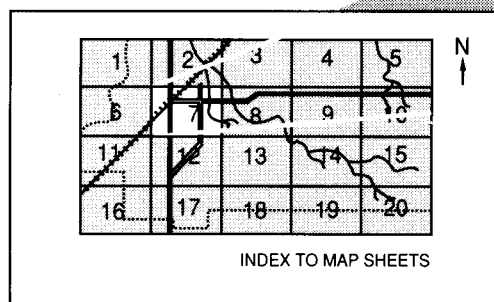
The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

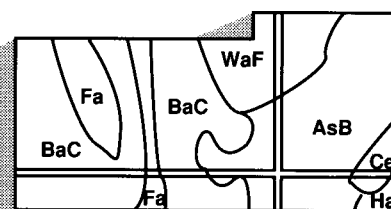
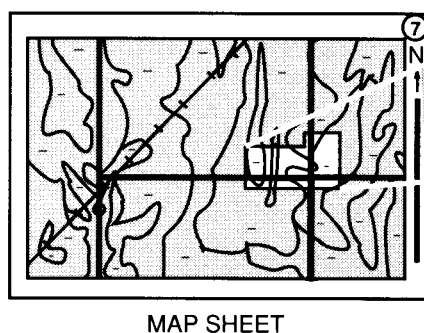
## Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.



Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

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This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1986. Soil names and descriptions were approved in 1986. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1986. This soil survey was made cooperatively by the Soil Conservation Service and the University of Florida; Institute of Food and Agricultural Sciences; Agricultural Experiment Stations and Soil Science Department; Florida Department of Agriculture and Consumer Services; and the Florida Department of Transportation. It is part of the technical assistance furnished to the Highlands County Soil and Water Conservation District. The Highlands County Board of County Commissioners contributed financially to the acceleration of the survey.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

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**Cover: Lake Simmons is a typical sinkhole-formed lake. The citrus crop in the background is on Astatula sand, 0 to 8 percent slopes.**



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# Foreword

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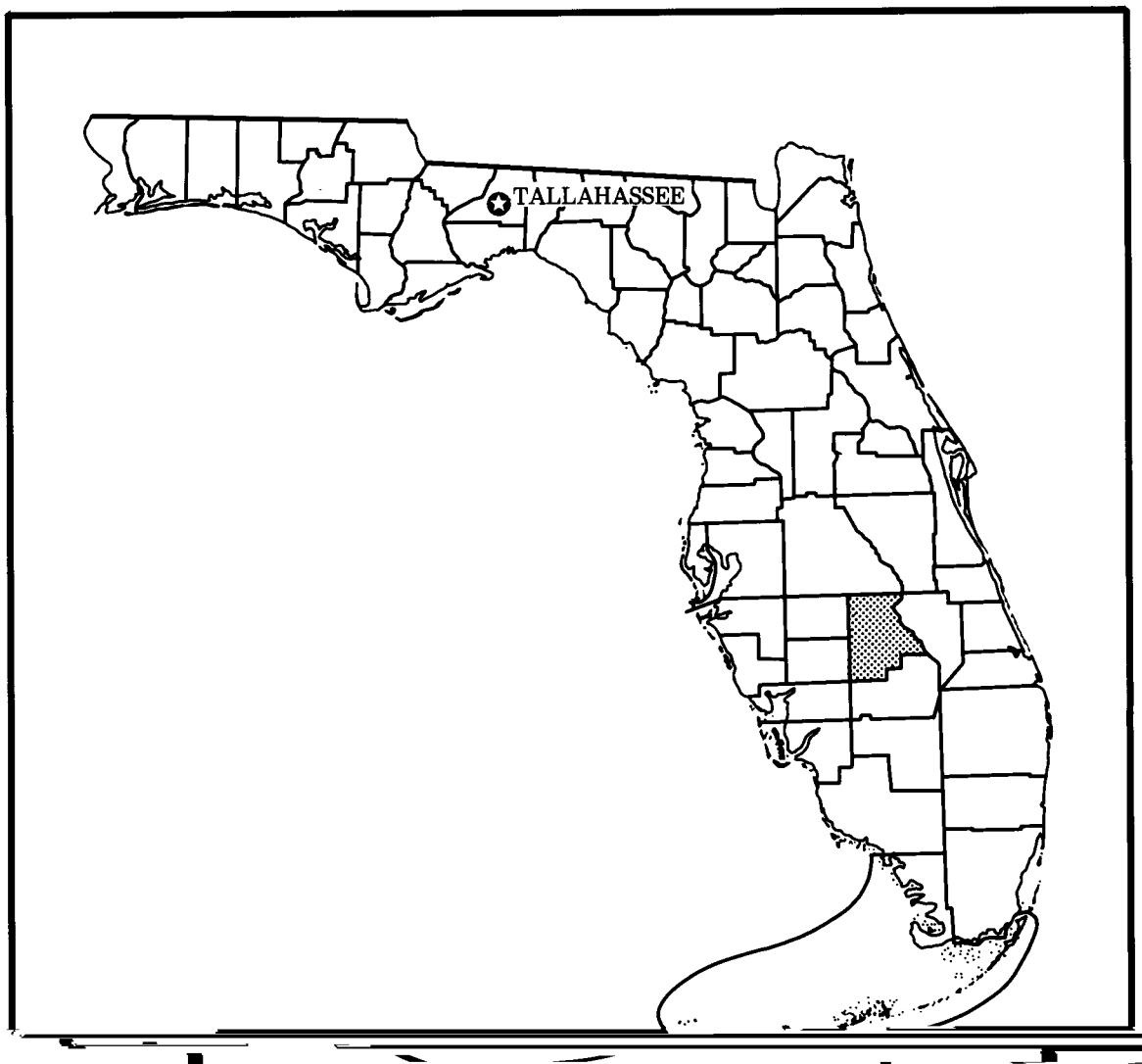
This soil survey contains information that can be used in land-planning programs in Highlands County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

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# Soil Survey of Highlands County, Florida

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United States Department of Agriculture, Soil Conservation Service,  
in cooperation with  
University of Florida; Institute of Food and Agricultural Sciences; Agricultural Experiment  
Stations and Soil Science Department; Florida Department of Agriculture and Consumer  
Services; and the Florida Department of Transportation

HIGHLANDS COUNTY is in the south-central part of peninsular Florida. It is bordered on the north by Polk County, on the west by DeSoto and Hardee Counties, and on the south by Glades County. The eastern boundary is the line of flow of the Kissimmee River.

Highlands County covers approximately 716,000 acres. Of this, about 658,310 acres is land area and the remaining acreage is large lakes that are in the ridge part of the county.

Citrus crops and ranching make up the base of the economy, and consumer services and retailing make up the remainder.

Sebring, the county seat, is in the northern part of the county.

## General Nature of the County

In this section, environmental and cultural factors that affect the use and management of the soils in Highlands County are described. These factors are climate, history, physiography and geology, water resources, farming, and transportation.

### Climate

The climate of Highlands County is characterized by long, warm, humid summers and by mild, dry winters.

The average temperature in summer is 81 degrees Fahrenheit, and the average temperature in winter is 62 degrees F. The average rainfall is about 54 inches.

Table 1 shows data for temperature and precipitation as recorded at Archbold Biological Station in the period 1932 to 1984.

In summer, temperatures vary only slightly from day to day. They are tempered by cumulus clouds and rain showers during the late afternoon. The average daily maximum temperature is about 92 degrees, and the average daily minimum temperature is about 68 degrees. The highest recorded temperature, which occurred during May 1953, is 103 degrees.

In winter, temperatures can vary considerably because of the dry, cold air from the north. It is not uncommon for temperatures to fall from a daytime high in the 70's to a nighttime low in the 30's with the passing of a cold front. The coldest temperatures usually occur the second night after the front passes.

During winter, the mean daily maximum temperature is 75 degrees, and the mean daily minimum temperature is 48 degrees. The lowest recorded temperature, which occurred during January 1982, is 13 degrees. Freezing temperatures can be expected several times from mid-November to the end of March. These freezing temperatures mostly occur during late December and January. They usually occur just before

sunrise, and it is very rare that the temperature does not get above 32 degrees during the day. Frost can severely damage vegetables, new growth on citrus trees, and improved pasture grasses, especially in the lower areas of the county.

Rainfall is seasonally distributed. Nearly 60 percent of the average annual precipitation falls in June through September. Most rainfall in summer comes as thundershowers of short duration during the afternoon and early evening hours. Lightning activity can be intense in these storms. These summer storms can sometimes be heavy with 2 or 3 inches of rain falling in an hour or two. Rains that last all day are rare in summer. When such rains occur, they are usually associated with a tropical storm. Rainfall in winter and spring is generally less intense than thundershowers but may last 24 hours or more.

Nearly all of the precipitation in Highlands County falls as rain. Hail falls occasionally late in the spring and

Captain William Hooker, Captain John Pearce, Skipper, Durrance, Williams, Whidden, and many others. Descendants of these early settlers still own and operate ranches in Highlands County. During the 1880's and 1890's, many of the communities that make up the largest populated areas today were established. These include Avon Park, Lake Placid, Venus, Fort Basinger, and Hicoria. Sebring, which became the county seat in the early 1920's, was started by George E. Sebring in 1911. His somewhat radical design for a city, which was laid out from a center circle, has given Sebring a flavor all its own. In 1912, the Atlantic Coast Line Railroad linked Sebring and Highlands County to the rest of the State and paved the way for the rapid development of the area in the early years.

Highlands County has developed steadily since it was formed in 1921. According to census figures, the population of Highlands County in 1921 was 2,924. The 1986 population of the county was 58,151. Agriculture

40 years. Many ranches were started with cowboys



dissect parts of the county. Most of these creeks are part of the Everglades drainage system and eventually make their way to Lake Okeechobee and south.

Many of the lakes are used as sources of irrigation

### Geology

The geology of Highlands County is primarily known from well cuttings and cores, since most of the formations described do not exist in surface exposures

the eastern part, and possibly the southwestern part, of Highlands County. It consists of shell marl, shelly sand, and possibly shelly limestone beds. Locally, the Tamiami Formation may be as much as 100 feet thick.

In the ridge section of the county, the Cypresshead Formation overlies the Hawthorn Group. It consists of sand, clay, and gravel that are generally red to orange. The top of this group is commonly exposed in clay pits along the ridge.

Over all of Highlands County, Pleistocene and Holocene sand and peat are at the surface. The thickness ranges between 1 and 100 feet. These undifferentiated deposits overlie the Cypresshead Formation, the Hawthorn Group, and the Tamiami Formation, depending upon their location in the county.

### Farming

Highlands County soils and climate are well suited to a variety of agricultural enterprises. Citrus crops and beef-cattle operations are the main enterprises, and others in the county include small scale vegetable production, nursery operations, caladium production,

crops include tomatoes, cucumbers, squash, and strawberries.

Nursery operations have been on the increase in recent years. A variety of wholesale nursery operations in the county include citrus, oaks, palms, azaleas, and ornamentals, and several retail outlets are in the county as well.

The growing of caladium tubers is a large agricultural enterprise unique to Highlands County. This is the only county in the country where tubers are grown for resale on a large scale. It is an estimated 5 to 7 million dollar industry. Caladiums are grown on deep, organic soils, such as Brighton muck and Hontoon muck. They are planted in April or May and harvested from November through March. Most growers farm 10- to 35-acre fields and can grow over 40 different varieties. The two main varieties are Condiom and Freidahemple. Caladiums are used in landscaping and for potted plants in the north.

The dairy industry is centered around 11 dairies throughout Highlands County. Most of these dairies have over 300 cows and range upward to 1,000 or

unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil

classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and

properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes.

Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small

areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

# General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for

The natural vegetation is sand pine, South Florida slash pine, turkey oak, sand oak, sand live oak, scattered saw palmetto, pricklypear cactus, and pineland threeawn (fig. 1).

This map unit makes up about 79,000 acres, or 12 percent, of the county. It is about 53 percent Astatula soils, 16 percent Paola soils, 15 percent Tavares soils, and 16 percent soils of minor extent.

Astatula soils are excessively drained. Typically, the surface layer of these soils is dark grayish brown sand about 7 inches thick. The underlying material to a depth of 80 inches or more is brownish yellow sand.

Paola soils are excessively drained. Typically, the surface layer of these soils is gray sand about 5 inches thick. The subsurface layer to a depth of 47 inches is

**Figure 1.—The natural vegetation on this Paola sand, 0 to 8 percent slopes, is mostly sand pine and sand live oak.**

This map unit consists of the deep, sandy, acid soils on the lower ridges in the ridge part of Highlands County. The soils in this map unit are in the northwestern corner of the county, parallel to U.S. Highway 27 to the southern county line. These soils

the surface layer of these soils is dark gray sand about 4 inches thick. The underlying material to a depth of 80 inches or more is white sand.

Archbold soils are moderately well drained. Typically, the surface layer of these soils is gray sand about 4 inches thick. The underlying material to a depth of 80

some areas have been cleared for citrus and pasture production. Other areas are used as building sites and as a source of sand for concrete.

#### Soils of the Flatwoods and Sloughs

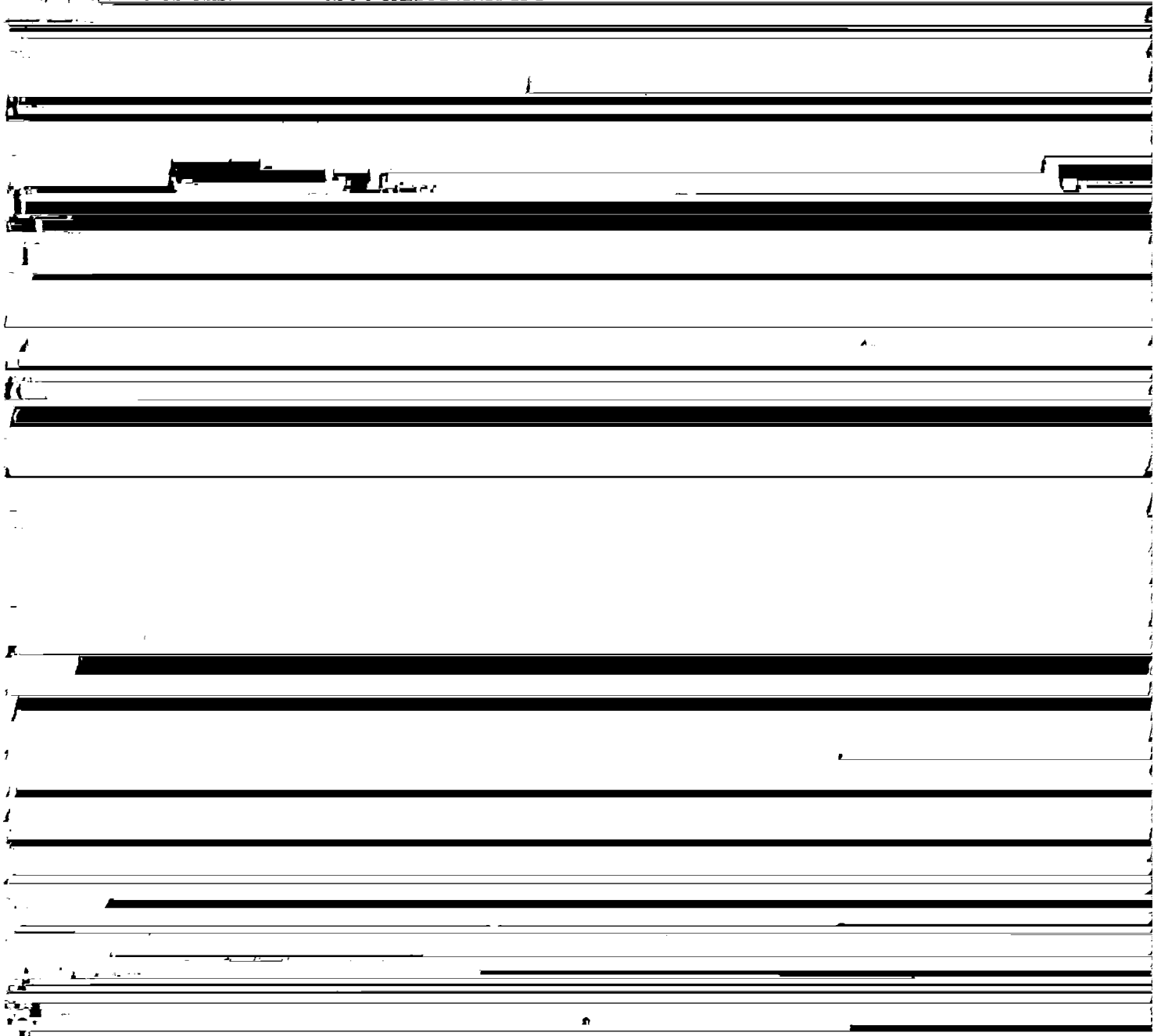
The four general soil map units in this group consist of nearly level, poorly drained or very poorly drained soils on the flatwoods and in sloughs. Map unit 3 is the largest of the general soil map units in the county. The

gray fine sand. The lower part to a depth of 80 inches is white fine sand.

Of minor extent in this map unit are mostly Basinger, Felda, Hicoria, and Placid soils.

Large acreages of the soils in this map unit have been cleared for pasture and citrus crops. The remainder is in native range.

#### 4. Felda-Hicoria-Malabar



surface layer of these soils is dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of 14 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 48 inches, is yellow, yellowish brown, and light yellowish brown fine sand. The lower part to a depth of 80 inches is greenish gray fine sandy loam.

Of minor extent in this map unit are mostly Basinger, Chobee, Pineda, Tequesta, and Valkaria soils.

Most areas have been cleared and are used for pasture. A few areas have been planted to citrus crops.

### 5. Basinger-Valkaria-Placid

*Nearly level, poorly drained or very poorly drained, sandy soils*

This map unit consists of narrow to broad sloughs, low flatwoods, and poorly defined drainageways that are interspersed with wet depressional areas. These areas are randomly scattered throughout the flatwoods part of Highlands County and vary in size and shape.

The natural vegetation on the poorly drained soils is slash pine, gallberry, pineland threeawn, cutthroat grass, maidencane, St. Johnswort, sand cordgrass, and various bluestems. The vegetation in the depressional areas is cypress, willow, and bay trees and pickerelweed, arrowhead, redroot, sawgrass, and St. Johnswort.

This map unit makes up about 112,000 acres, or 17 percent, of the land area of the county. It is about 50 percent Basinger soils, 20 percent Valkaria soils, 10 percent Placid soils, and 20 percent soils of minor extent.

Basinger soils are poorly drained. The surface layer of these soils is dark gray fine sand 6 inches thick. The subsurface layer, to a depth of 21 inches, is light gray and light brownish gray fine sand. The subsoil, to a depth of 52 inches, is brown fine sand. The substratum to a depth of 80 inches is light brownish gray and grayish brown fine sand and loamy fine sand.

Valkaria soils are poorly drained. The surface layer of these soils is gray fine sand about 5 inches thick. The subsurface layer, to a depth of 16 inches, is light gray fine sand. The subsoil, to a depth of 51 inches, is yellowish brown and light yellowish brown fine sand. The substratum to a depth of 80 inches is light gray fine sand.

Placid soils are very poorly drained. The upper part of the surface layer of these soils is black fine sand about 3 inches thick. The lower part, to a depth of 11 inches, is very dark gray fine sand. The underlying material to a depth of 80 inches is in layers of light

brownish gray and dark grayish brown fine sand.

Of minor extent in this map unit are mostly Felda, Immokalee, Malabar, Myakka, Sanibel, and Satellite soils.

Most areas of this map unit remain in natural vegetation and are used as habitat for wildlife and as rangeland. Some areas have been cleared and are used for pasture.

### 6. Oldsmar-EauGallie-Pomona

*Nearly level, poorly drained, sandy soils that have an organic-stained subsoil underlain by loamy material*

This map unit consists mostly of soils in flatwood areas that are adjacent to sloughs and drainageways. The soils in this map unit are near Fisheating Creek and near other major drainageways in the county. Also, these soils are along the Hardee County line. This map unit is the smallest of the general soil map units in Highlands County.

The natural vegetation is slash pine, saw palmetto, gallberry, fetterbush, running oak, waxmyrtle, pineland threeawn, creeping bluestem, chalky bluestem, maidencane, and other forbs and grasses.

This map unit makes up about 13,000 acres, or 2 percent, of the county. It is about 35 percent Oldsmar soils, 25 percent EauGallie soils, 10 percent Pomona soils, and 30 percent soils of minor extent.

Typically, Oldsmar soils have a surface layer of very dark gray sand about 4 inches thick. The subsurface layer, to a depth of 32 inches, is gray and light gray sand. The upper part of the subsoil, to a depth of 54 inches, is black, dark brown, and brown fine sand. The lower part, to a depth of 60 inches, is grayish brown sandy clay loam. The substratum to a depth of 80 inches is yellowish brown fine sand.

Typically, EauGallie soils have a surface layer of very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of 26 inches, is gray and light gray fine sand. The upper part of the subsoil, to a depth of about 40 inches, is black and dark reddish brown fine sand. The lower part of the subsoil to a depth of 80 inches is light brownish gray sandy clay loam and fine sandy loam.

Typically, Pomona soils have a surface layer of black sand about 6 inches thick. The subsurface layer, to a depth of 29 inches, is gray and light gray sand. The upper part of the subsoil, to a depth of 51 inches, is dark brown and very dark grayish brown sand coated with organic matter. Below that layer, to a depth of 61 inches, is light brownish gray sand. The lower part of



**Figure 2.—This hardwood swamp consists mostly of redbay and sweetbay trees. The soil is Gator muck.**

the subsoil to a depth of 80 inches or more is gray sandy loam.

Of minor extent in this map unit are mostly Felda, Immokalee, Malabar, Myakka, and Smyrna soils.

Much of the acreage in this map unit is in native range or improved pasture. Some soils in this map unit have been drained and converted to use for citrus crops. The rest of this map unit is in native range.

#### **Soils of the Swamps and Marshes**

The two general soil map units in this group consist of nearly level, very poorly drained soils. Most of the soils in these map units are organic. These soils are

mainly in large hardwood swamps (fig. 2) or grassy marshes, and some of these soils are in open depressions on the flatwoods. The largest area of these general soil map units is south of Lake Istokpoga. Several other large areas of these soils are scattered throughout the county.

#### **7. Kaliga-Tequesta-Gator**

*Nearly level, very poorly drained soils that have an organic layer underlain by loamy material*

This map unit consists mostly of soils in large marshes, swamps, and depressional areas in Highlands County. A large area of soils in this map unit is on the

The natural vegetation is sweetbay and redbay trees and pickerelweed, arrowhead, sawgrass, waxmyrtle, maidencane, St. Johnswort, and other water-tolerant grasses and grasslike plants.

This map unit consists of broad marshes that are adjacent to Lake Istokpoga and to Morgan Hole and Arbuckle Creeks on the Avon Park Bombing Range. The soils in this map unit are also near drainageways that drain into small lakes around Highlands County.

The natural vegetation consists of sweetbay, blackgum, red maple, and cypress trees and St. Johnswort, sawgrass, waxmyrtle, arrowhead, pickerelweed, and maidencane.

This map unit makes up about 46,000 acres, or about 7 percent of the county. It is about 25 percent

small part of this map unit is on the Avon Park Bombing Range that is adjacent to a small isolated ridge east of Morgan Hole Creek.

The natural vegetation in the cutthroat seep is mostly made up of cutthroat grass, pineland threeawn, and slash pine. Other vegetation in the seep is St. Johnswort, waxmyrtle, creeping bluestem, fetterbush, gallberry, saw palmetto, and maidencane and bay trees.

This map unit makes up about 26,000 acres, or about 4 percent, of the county. It is about 40 percent Basinger soils, 20 percent St. Johns soils, 15 percent Placid soils, and 25 percent soils of minor extent.

surface layer of these soils is black sand about 11 inches thick. The subsurface layer, to a depth of 26 inches, is light brownish gray sand. The subsoil is sand throughout. The upper part of the subsoil, to a depth of 31 inches, is very dark brown. Below that layer, to a depth of 49 inches, the subsoil is black. The next layer, to a depth of 70 inches, is dark yellowish brown. The lower part of the subsoil to a depth of 80 inches or more is very dark gray.

Placid soils are very poorly drained. Typically, the surface layer of these soils is black fine sand about 3 inches thick. Below that layer, to a depth of 14 inches,



## Detailed Soil Map Units

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The map units on the detailed soil maps at the back of this manual represent the soils in the survey area.

An *undifferentiated group* is made up of two or more soils that could be mapped separately but are mapped

The map unit descriptions in this section, along with the

as one unit because similar interpretations can be made

table is more than 80 inches.

Most of the acreage of this soil is in citrus or natural vegetation. Some areas have been cleared for improved pasture and cultivated crops. The natural vegetation consists of sand pine, slash pine, turkey oak, scrub hickory, myrtle oak, Chapman oak, and sand live oak. The understory consists of scattered saw palmetto and

very low. The permeability is very rapid. Depth to the water table is more than 80 inches.

Most of the acreage of this soil is in natural vegetation. Some areas have been cleared for citrus crops. The natural vegetation consists of rosemary, sand pine, Chapman oak, myrtle oak, and a few scrub hickory. The understory consists of scattered saw palmetto and briarclimber cactus.

This Paola soil has very severe limitations for cultivated crops. Intensive management, including irrigation, is required if this soil is cultivated.

Citrus trees are well suited to this soil under a high level of management. Good yields of oranges and grapefruit can be obtained with adequate irrigation. A properly designed irrigation system is needed to ensure consistent high yields.

The potential of this soil for production of pasture and hay crops is low. Bahiagrass and pangolagrass are best adapted to this soil. Regular applications of fertilizer and lime are needed. Grazing should be controlled to permit plants to recover from grazing and to maintain vigor.

The potential of this soil for production of pine trees is low. Equipment use limitations and seedling mortality are the main management problems. Sand pine is the preferred tree for planting.

The potential of this soil for the production of desirable range plants is very low. The plant community consists of a woody understory, which is seldom grazed by livestock. This soil is in the Sand Pine Scrub range site.

This soil has slight limitations for most urban uses, such as dwellings and local roads and streets. For lawns and recreational development, this soil has

This St. Lucie soil has very severe limitations for cultivated crops. Intensive management, including irrigation, is required if this soil is cultivated. Droughtiness and rapid leaching of plant nutrients reduce potential yields of adapted crops.

Citrus trees are moderately suited to this soil. A properly designed irrigation system is needed to ensure optimum yields and survival of the trees.

Pasture and hay crops are not suited to this soil. Droughtiness and the available water capacity are the limiting factors.

The potential of this soil for production of pine trees is low. Equipment use limitations and seedling mortality are the main management problems. Sand pine is the preferred tree for planting.

The potential of this soil for the production of desirable range plants is very low. The plant community consists of dense woody plants, which are not used by livestock. No appreciable forage is on this soil. This soil is in the Sand Pine Scrub range site.

This soil has slight limitations for most urban uses. If the soil is used for lawns and gardens, it must be irrigated. It has severe limitations for recreational development because the surface layer is too sandy. This limitation can be overcome by stabilizing the

The available water capacity of this Basinger soil is low. The permeability is rapid. Internal drainage is very slow because of the high water table. This soil is ponded for 4 to 6 months each year.

Most of the acreage of this soil is in natural vegetation. The natural vegetation consists of pickerelweed, maidencane, cutgrass, sand cordgrass, St. Johnswort, and chalky bluestem. A few areas are in water-tolerant trees.

This Basinger soil has very severe limitations for cultivated crops because of ponding. It is not suited to cultivated crops without an intensive water control system to remove excess surface water rapidly after heavy rains and to provide for rapid internal drainage from the soil above the high water table. Most places do

flatwood areas. The mapped areas are irregular in shape and mostly range from 10 to 125 acres. The slopes are generally smooth to convex.

Typically, the surface layer is dark gray sand about 6 inches thick. The subsurface layer, to a depth of 51 inches, is light gray and white sand. The upper part of the subsoil, to a depth of 59 inches, is dark reddish brown sand. The lower part to a depth of 80 inches is mixed yellowish brown and very pale brown sand.

Included with this soil in mapping are small areas of Archbold, Orsino, Paola, Pomello, and Satellite soils. In most areas, the included soils make up 10 to 30 percent of the map unit.

The available water capacity of this Duette soil is very low. The permeability is moderately rapid. The water table is at a depth of 48 to 72 inches for 1 to 4

Citrus trees are not suited to this soil unless a water control system is established and maintained to regulate the water table. The trees should be planted in bedded rows.

Under natural conditions, this soil is not suited to improved pasture; however, if adequate measures are taken to remove excess surface water and intensive management practices used, the potential of this soil for production of improved pasture grasses is moderate. Pangolagrass, bahiagrass, and white clover are well adapted to this soil. Grazing should be controlled to maintain plant vigor, and regular applications of lime and fertilizer are needed

months during the summer rainy season. It recedes to a lower depth during the rest of the year.

Most of the acreage of this soil remains in native vegetation or is in citrus crops. A few areas have been cleared for cultivated crops and improved pasture. The natural vegetation consists of sand and slash pines and sand live oak, Chapman oak, and myrtle oak. The understory consists of scattered saw palmetto and pineland threeawn.

This Duette soil has very severe limitations for cultivated crops. Intensive management is required if the soil is cultivated. Droughtiness and rapid leaching of plant nutrients reduce the variety and potential yields of

without basements. For other urban uses, it has moderate limitations because the seasonal high water table is at a depth of 4 to 6 feet. This soil has severe limitations for recreational development because it is too sandy, causing poor trafficability. This limitation can be reduced or overcome by adding suitable topsoil or by stabilizing the surface layer.

This Duette soil is in capability subclass VIs.

**5—Daytona sand, 0 to 5 percent slopes.** This nearly level to gently sloping, moderately well drained soil is on elevated ridges on the flatwoods and on moderately high ridges in the ridge part of the county. The mapped areas are irregular in shape and range from 15 to more than 75 acres. The slopes are

main concerns in management. Slash, south Florida slash, and longleaf pines are the preferred trees for planting.

The potential of this soil for the production of range plants is very low. The plant community consists of a dense woody understory, which is seldom grazed by cattle. The dominate forage is pineland threeawn. This soil is in the Sand Pine Scrub range site.

This soil has slight limitations for dwellings without basements, small commercial buildings, and local roads and streets. Lawns have to be watered regularly. This soil has moderate limitations if used as septic tank absorption fields because the water table is between depths of 40 and 60 inches for part of the year. For recreational development, this soil has severe

generally smooth to convex.

Typically, the surface layer is very dark gray sand about 3 inches thick. The subsurface layer, to a depth of 36 inches, is white sand. The upper part of the subsoil, to a depth of 45 inches, is black sand. The lower part, to a depth of 59 inches, is mixed black sand gradually changing to brown sand. The substratum to a depth of 80 inches or more is light gray sand.

Included with this soil in mapping are small areas of Archbold, Duette, Immokalee, Pomello, and Satellite soils. In most areas, the included soils make up 15 to 30 percent of the map unit.

The available water capacity of this Daytona soil is very low. The permeability is moderately rapid. The water table is at a depth of 40 to 60 inches during the summer rainy season. It recedes to a lower depth during the rest of the year.

Most of the acreage of this soil is in natural vegetation. Some areas have been cleared for citrus

limitations because it is sandy, causing poor trafficability. This limitation can be overcome by adding suitable topsoil or by stabilizing the surface layer.

This Daytona soil is in capability subclass VIs.

**6—Tavares sand, 0 to 5 percent slopes.** This nearly level to gently sloping, moderately well drained soil is on moderately high sandy ridges in the ridge part of the county. The mapped areas are irregular in shape and range from 15 to about 50 acres. The slopes are smooth to convex.

Typically, the surface layer is dark grayish brown sand about 6 inches thick. The upper part of the underlying material, to a depth of about 56 inches, is yellow and very pale brown sand. The lower part to a depth of 80 inches or more is white sand.

Included with this soil in mapping are small areas of Archbold, Astatula, Orsino, Paola, St. Lucie, and Satellite soils. In most areas, the included soils make up 10 to 20 percent of the map unit.



adapted crops. Irrigation is advisable if adequate water is readily available.

Citrus trees are well suited to this soil. Good yields of oranges and grapefruit can be obtained in some years without irrigation. A properly designed irrigation system is needed to ensure consistent high yields.

The potential of this soil for production of pasture grasses and hay crops is moderate. Bahiagrass and bermudagrass are well adapted to this soil. Grazing should be controlled to permit plants to recover from grazing and to maintain plant vigor.

The potential of this soil for production of pine trees is moderate. Equipment use limitations and seedling mortality are the main management problems. Slash, south Florida slash, and longleaf pines are the preferred trees for planting.

The potential of this soil for production of range plants is low. The plant community consists of a dense woody understory, which is seldom grazed by livestock. The dominant forage is pineland threeawn. This soil is in the Longleaf Pine-Turkey Oak Hills range site.

This soil has moderate limitations for most uses.

long dry periods, it may recede to a depth of more than 30 inches.

Most of the acreage of this soil is in natural vegetation of bays and other water-tolerant trees and sawgrass, pickerelweed, arrowhead, redroot, St. Johnswort, cutthroat grass, and maidencane.

Under natural conditions, this Placid soil has very severe limitations for cultivated crops. Not only is wetness, which is caused by ponding, a very severe problem, but drainage and water control are also severe problems. Adequate water control systems are difficult to establish in most areas because suitable drainage outlets are not available. If a water control system can be established and maintained, most locally adapted vegetable crops can be successfully grown.

This soil is not suited to citrus trees unless a proper water control system is established and maintained to regulate the water table. The trees should be planted in bedded rows.

Under natural conditions, this soil is not suited to improved pasture; however, improved pasture can be established if necessary.

the ridge part of the county. The mapped areas are irregular in shape and range from 15 to more than 500 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is black sand about 6 inches thick. The subsurface layer, to a depth of 37 inches, is gray and white sand. The subsoil to a depth of 80 inches is black sand.

Included with this soil in mapping are small areas of Basinger, Felda, Myakka, Pomello, Satellite, and Smyrna soils. In most areas, the included soils make up 10 to 15 percent of the map unit.

The available water capacity of this Immokalee soil is low. The permeability is moderate. The water table is within 12 inches of the surface during the summer rainy season. Generally, it is between depths of 12 and 40 inches for the rest of the year. The water table may recede to a depth of more than 40 inches during extended dry periods. Also, this soil can have a perched

water table because of the high water table. Trees should be planted in bedded rows for highest productivity. Slash and south Florida slash pines are the preferred trees for planting.

The potential of this soil for the production of desirable range plants is moderate. This soil has the potential for producing significant amounts of creeping bluestem, chalky bluestem, indiagrass, and other desirable range plants. As the range deteriorates, pineland threeawn and saw palmetto dominate the site. Management of the native rangeland should include crossfencing, cattle rotation to help maintain plant vigor, and careful consideration of the number of cattle per acre based on range condition and size of the site. This soil is in the South Florida Flatwoods range site.

This soil has severe limitations for most urban uses because of wetness. Septic tank absorption fields should be mounded to maintain the system well above the seasonal high water table. Building sites for

saw palmetto, sabal palmetto, bluestem, paspalum, cactus, and pineland threeawn.

This Astatula soil has very severe limitations for most cultivated crops. Intensive management is required if the soil is cultivated. Droughtiness and rapid leaching of plant nutrients reduce the variety and potential yields of adapted crops. An irrigation system is needed during dry periods.

Citrus trees are well suited to this soil. Where a high level of management and a properly designed irrigation system are used, groves can produce yields of 500 boxes per acre.

The potential of this soil for production of improved pasture grasses is moderate; however, grazing should be controlled to permit plants to recover and to maintain vigor. Bahiagrass and pangolagrass are best adapted to this soil.

The potential of this soil for production of pine trees is moderate. Equipment use limitations and seedling mortality are the main management problems. Sand pine is the preferred tree for planting.

very low. The permeability is moderate. The water table is at a depth of less than 12 inches during the summer rainy season. Generally, it is at a depth of 12 to 40 inches during the rest of the year. During extended dry periods, the water table recedes to a depth of more than 40 inches. Also, this soil can have a perched water table because of the permeability of the subsoil.

A large part of the acreage of this soil has been cleared for improved pasture and vegetable crops and, in more recent years, has been used for citrus crops. Significant acreage remains in natural vegetation that consists mainly of slash pine, south Florida slash pine, longleaf pine, fetterbush, gallberry, running oak, waxmyrtle, and saw palmetto (fig. 3). Pineland threeawn is the dominant grass; but depending on range condition, there are significant amounts of creeping bluestem, lopsided indiagrass, chalky bluestem, and other grasses.

This Myakka soil has severe limitations for cultivated crops because of wetness and the sandy texture. With proper management and use of conservation practices,

however, this soil is well suited to a variety of vegetable

**Figure 3.—The natural vegetation on this Myakka fine sand is saw palmetto and slash pine.**

good range management plan. This soil is in the South Florida Flatwoods range site.

This soil has severe limitations for most urban uses because of wetness. The limitations for septic tank absorption fields can be overcome by backfilling and mounding to maintain the system above the seasonal high water table. For recreational development, this soil also has severe limitations because of wetness; but with proper drainage to remove excess surface water, most of the limitations can be overcome.

This Myakka soil is in capability subclass IVw.

**11—Orsino sand, 0 to 5 percent slopes.** This nearly level to gently sloping, moderately well drained soil is on moderately high sandy ridges in the ridge part of the

county. The mapped areas are irregular in shape and range from 15 acres to more than 100 acres. The slopes are smooth to convex.

Typically, the surface layer is gray sand about 2 inches thick. The subsurface layer, to a depth of 46 inches, is white sand. The subsoil, to a depth of about 66 inches, is yellowish brown, reddish brown, and dark reddish brown sand. The substratum to a depth of 80 inches or more is very pale brown sand.

Included with this soil in mapping are small areas of Archbold, Duette, Paola, Pomello, St. Lucie, and Tavares soils. In most areas, the included soils make up 10 to 25 percent of the map unit.

The available water capacity of this Orsino soil is very low. The permeability is very rapid. The water table

is at a depth of 42 to 72 inches for 1 to 4 months during the summer rainy season. It recedes to a lower depth during the rest of the year.

Most of the acreage of this soil is in citrus crops or has been left in natural vegetation. Some areas have been cleared for improved pasture and cultivated crops.

more. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 21 inches, is light gray and light brownish gray fine sand. The subsoil, to a depth of 52 inches, is brown fine sand. The upper part of the substratum, to a depth

is moderate. Seedling mortality is the main concern in management because of wetness. Slash and south Florida pines are the preferred trees for planting.

The potential of this soil for the production of range plants is moderately high. This soil has the potential for producing high amounts of blue maidencane, chalky bluestem, and bluejoint panicum. To maintain the range, a good range management plan should include such considerations as grazing time and number of cows per acre. This soil is in the Slough range site.

This soil has severe limitations for urban uses because of wetness. Limitations for certain crops

bluestems, sand cordgrass, maidencane, saw palmetto, and fetterbush.

Under natural conditions, this Felda soil has severe limitations for cultivated crops because of wetness; however, if a water control system is established and maintained, a variety of vegetable crops is suitable for this soil. The water control system is needed to remove excess surface water during wet periods and provide subsurface irrigation during dry periods. Fertilizer should be added according to the need of the crops.

This soil is poorly suited to citrus trees; however, if a properly designed water control system is established

absorption fields can be overcome by mounding and backfilling to maintain the system above the seasonal high water table. This soil also has severe limitations for recreational development because of wetness and the sandy texture. Providing a drainage system to remove excess surface water and adding suitable topsoil or resurfacing the area will overcome this limitation.

This Felda soil is in the Felda soil series.

and maintained to regulate the water table, citrus is suitable. The trees should be planted in bedded rows to help maintain the root system above the water table. An irrigation system is needed, and fertilizer should be applied at regular intervals. Plant cover should be maintained between the rows to prevent erosion of the beds.

The potential of this soil for the production of

flatwoods and on the lower ridges in the ridge part of the county. The mapped areas are irregular in shape and range from 10 to more than 100 acres. The slopes are generally smooth to convex and range from 0 to 2 percent.

Typically, the surface layer is dark gray sand about 4 inches thick. The underlying material to a depth of 80 inches is white fine sand that has brown mottles in the upper part of this horizon.

Included with this soil in mapping are small areas of Archbold, Basinger, Daytona, Duette, Immokalee, Myakka, and Pomello soils. In most areas, the included soils make up 10 to 20 percent of the map unit.

The available water capacity of this Satellite soil is very low. The permeability is very rapid. The water table is at a depth of 12 to 40 inches for 2 to 6 months.

Most of the acreage of this soil is in natural vegetation, but some areas have been cleared for pasture and citrus crops. The natural vegetation consists of slash pine, south Florida slash pine, longleaf pine, myrtle oak, Chapman oak, and sand live oak. The understory consists of saw palmetto and pineland

too sandy. By adding suitable topsoil or stabilizing the surface, this limitation can be minimized.

This Satellite soil is in capability subclass VI<sub>s</sub>.

**15—Bradenton fine sand.** This nearly level, poorly drained soil is on hammocks and in open areas on the flatwoods. The mapped areas are irregular in shape and range from 5 to more than 50 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of 14 inches, is light gray fine sand. The subsoil, to a depth of 44 inches, is gray very fine sandy loam. White calcium carbonate nodules are in the lower part of the subsoil. The substratum to a depth of 80 inches is light brownish gray and greenish gray loamy sand and very fine sandy loam.

Included with this soil in mapping are small areas of Felda, Hicoria, Malabar, and Pineda soils. In most areas, the included soils make up 15 to 20 percent of the map unit.

The available water capacity of this Bradenton soil is moderate. The permeability is moderate. The water

**Figure 4.—This improved pasture is on Bradenton fine sand. The cabbage palm hammocks are used for shade and as a resting area for the cattle.**

system is needed to remove excess surface water during heavy periods of rainfall. White clover, improved bahiagrass, and pangolagrass are best adapted to this soil.

The potential of this soil for production of pine trees is high. The main concerns in management are seedling mortality and equipment use limitations during wet periods. Slash and south Florida slash pines are the preferred trees for planting.

The potential of this soil for the production of desirable range plants is very low because of the dense canopy of palm trees. The shaded areas are preferred resting places for cattle and, as such, are generally severely grazed. This soil is in the Wetland Hardwood Hammock range site.

This soil has severe limitations for most urban uses because of wetness. Building sites for small buildings without basements should be mounded to prevent moisture problems caused by the high water table. Septic tank absorption fields should also be mounded to

maintain the system above the seasonal high water table. Most of the wetness problems can be overcome by providing adequate drainage.

This Bradenton soil is in capability subclass IIIw.

**16—Valkaria fine sand.** This nearly level, poorly drained soil is on the low flatwoods and in sloughs and poorly defined drainageways. The mapped areas are irregular in shape and range from 10 to 100 acres or more. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is gray fine sand about 5 inches thick. The subsurface layer, to a depth of about 16 inches, is light gray fine sand. The subsoil, to a depth of 51 inches, is yellowish brown and light yellowish brown fine sand. The substratum to a depth of 80 inches or more is light gray fine sand.

Included with this soil in mapping are small areas of Basinger, Felda, Immokalee, Malabar, Myakka, and Satellite soils. In most areas, the included soils make



up 10 to 25 percent of the map unit.

The available water capacity of this Valkaria soil is low. The permeability is rapid. The water table is within 12 inches of the surface for 2 to 4 months during the summer rainy season. Generally, it is between depths of 12 to 40 inches for 6 months or more but may recede to a lower depth during extended dry periods.

Large areas of this soil have been cleared for improved pasture and vegetable crops. Many areas remain in natural vegetation that consists of slash pine, south Florida slash pine, gallberry, pineland threeawn, cutthroat grass, maidencane, bluestem, St. Johnswort, and cordgrass.

This Valkaria soil has very severe limitations for cultivated crops because of wetness, but this limitation can be partly overcome if a properly designed water control system is established and maintained to remove excess surface water during wet periods and provide irrigation during dry periods. Soil amendments should be added according to the need of the crops.

This soil is poorly suited to citrus trees. If a properly designed water control system is established and maintained to regulate the water table, however, citrus is suitable. Controlling the depth of the water table is vital to the success of growing citrus, which should be planted in bedded rows with a cover crop to prevent erosion. Irrigation should be available during extended dry periods.

The potential of this soil for production of improved pasture grasses and hay crops is moderate. Pangolagrass, bahiagrass, and white clover are best adapted to this soil if well managed. A water control system to remove excess surface water after heavy rainfall is needed to ensure optimum yields. On improved pasture sites, grazing should be controlled to maintain plant vigor.

The potential of this soil for production of pine trees is moderate. Because of wetness, seedling mortality and equipment use limitations are the main concerns in management. Slash and south Florida slash pines are the preferred trees for planting.

The potential of this soil for the production of range plants is moderately high. This soil has the potential for producing high amounts of blue maidencane, chalky bluestem, and bluejoint panicum. To maintain the range, a good range management plan should include such considerations as grazing time and number of cattle per acre. This soil is in the Slough range site.

This soil has severe limitations for most urban uses because of wetness. Limitations for septic tank absorption fields can be overcome by mounding to maintain the system above the seasonal high water

table. This soil also has severe limitations for recreational development because of wetness and the sandy texture. Providing a drainage system to remove excess surface water and adding suitable topsoil or resurfacing the area will overcome this limitation.

This Valkaria soil is in capability subclass IVw.

**17—Malabar fine sand.** This nearly level, poorly drained soil is in low, narrow to broad sloughs or in poorly defined drainageways on the flatwoods. The mapped areas are irregular in shape and range from 10 to more than 100 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of 14 inches, is light gray fine sand. The upper part of the subsoil, to a depth of 48 inches, is yellow, yellowish brown, and light yellowish brown fine sand. The lower part to a depth of more than 80 inches is greenish gray fine sandy loam.

Included with this soil in mapping are small areas of Basinger, Felda, Pineda, and Valkaria soils. In some places are soils that are similar to Malabar soil but have a layer of organic staining just above the loamy subsoil. In most areas, the included soils make up 15 to 25 percent of the map unit.

The available water capacity of this Malabar soil is low. The permeability is slow or very slow. The water table generally is within 12 inches of the surface for 2 to 6 months during the summer rainy season. During the rest of the year, it is generally between depths of 12 and 40 inches. During dry periods, the water table may recede to a lower depth for a short time.

Most areas of this soil are in improved pasture and native rangeland. The natural vegetation consists of slash pine, south Florida slash pine, cabbage palm, saw palmetto, waxmyrtle, gallberry, maidencane, various species of bluestems, pineland threeawn, and sedges.

This Malabar soil has severe limitations for cultivated crops because of wetness. If the high water table problem can be overcome by establishing and maintaining a suitable water control system, a variety of vegetable crops can be grown. Proper management practices should include crop rotation, cover crops in the rotation system, and applications of fertilizer according to the need of the crops.

This soil is poorly suited to citrus trees. Citrus trees can be adapted to this soil if a properly designed water control system can be constructed and maintained to regulate the water table at the proper depth and also to provide irrigation. Trees should be planted in bedded rows, and a cover crop should be maintained between

the rows to prevent erosion of the beds. Fertilizer

areas, the included soils make up 10 to 15 percent of

The potential of this soil for production of pasture and hay crops is moderate. Pangolagrass, improved bahiagrass, and white clover are best adapted to this soil. A water control system is needed to remove excess surface water after heavy rainfall. Grazing should be controlled to prevent overgrazing and weakening of the plants. Regular applications of fertilizer are needed.

The potential of this Malabar soil for production of pines is moderate. The main management concerns are seedling mortality and equipment use limitations during wet periods. Bedding of the trees and a simple drainage system to remove excess surface water is needed if the potential productivity is to be realized. Slash and south Florida slash pines are the preferred trees for planting.

The potential of this soil for the production of desirable range plants is moderately high. Significant amounts of creeping bluestem, South Florida bluestem, various panicums, and maidencane can be expected under good management that includes crossfencing, cattle rotation, and careful consideration of the number of cattle per site. This soil is in the Slough range site.

This soil has severe limitations for most urban uses because of wetness. Septic tank absorption fields should be mounded to maintain the system above the seasonal high water table. Building sites for small buildings without basements also should be mounded to prevent moisture problems because of wetness. This soil also has severe limitations for recreational development because of wetness and the sandy texture. Providing a drainage system to remove excess surface water and adding suitable topsoil or resurfacing the area will overcome this limitation.

This Malabar soil is in capability subclass IVw

The available water capacity of this Kaliga soil is very high. The permeability is slow or very slow. Under natural conditions, this soil is ponded for 6 to 9 months in most years. The water table is generally within 10 inches of the surface for the rest of the year.

Many areas of this soil have been drained for improved pasture and speciality crops. The smaller areas generally remain in natural vegetation of sweetbay, cypress, red maple, blackgum, willow, St. Johnswort, sawgrass, arrowhead, pickerelweed, and maidencane.

This Kaliga soil has very severe limitations for cultivated crops. This soil is well suited to a variety of vegetable crops if a properly designed water control system can be established and maintained. Because of the naturally high acidity, lime should be added to adjust the pH. In Highlands County, several areas of this soil are being used to grow speciality crops of caladium bulbs and sod.

With adequate drainage, this soil has very high potential for production of pasture and hay crops. Pangolagrass, hermarthria, white clover, and bahiagrass are best adapted to this soil. The water control system should maintain the water table near the surface to prevent excess oxidation of the organic material. Lime is needed on this soil, and also fertilizer that is high in potash and trace elements because they are generally deficient in organic soils.

This soil is not suited to citrus or pine trees.

The potential of this soil for producing significant amounts of desirable range plants is high. Maidencane and cutgrass are the most desirable plants. Many areas of this soil provide little or no vegetation that cattle prefer. Those areas that do produce desirable plants

Typically, the upper part of the surface layer is black mucky sand about 4 inches thick. The lower part, to a depth of 15 inches, is black fine sand. The subsurface layer, to a depth of 21 inches, is light gray sand. The upper part of the subsoil, to a depth of 39 inches, is dark gray fine sandy loam. The lower part, to a depth of 52 inches, is grayish brown fine sandy loam. The substratum to a depth of 80 inches is dark gray fine sandy loam.

Included with this soil in mapping are small areas of Felda, Placid, Sanibel, and Tequesta soils. In places are areas of soils that are similar to Hicoria soil, but they have a fine textured subsoil at a depth of more than 40 inches. The included soils make up 10 to 15 percent of the map unit.

The available water capacity of this Hicoria soil is high. The permeability is moderately slow or slow in the subsoil. In most areas, this soil is ponded most of the year. The water table is at a depth of 10 inches or less much of the rest of the year. It can recede to a lower depth during extended dry periods and during the winter.

Some areas of this soil have been drained for improved pasture, but most remain in natural vegetation. The natural vegetation consists of cypress, red maple, blackgum, willow, and bay trees and pickerelweed, arrowhead, maidencane, sawgrass, and other water-tolerant plants.

Under natural conditions, this Hicoria soil has very severe limitations for cultivated crops. Ponding, internal drainage, and unavailability of suitable drainage outlets severely restrict the use of this soil. If a properly designed water control system can be established and maintained, most cultivated crops can be grown.

This soil is not suited to citrus trees unless a proper water control system can be established and maintained to regulate the water table. The trees should be planted in bedded rows.

Under natural conditions, this soil is not suited to improved pasture; however, improved pasture can be

small amounts of desirable range plants, some do and are valuable assets to a good native rangeland management program. These more productive areas are not grazed during wet periods and grazing is deferred until winter when other range plants are of reduced value and quantity. This soil is in the Freshwater Marshes and Ponds range site.

This soil has severe limitations for all urban and recreational uses because of ponding. Good drainage systems that will adequately remove the water and regulate the water table are expensive and difficult to establish and maintain. Most areas do not have adequate water outlets; and even if the soil is drained, the problem of keeping the areas adequately drained is a continuing hazard.

This Hicoria soil is in capability subclass VIIw.

**20—Samsula muck.** This nearly level, very poorly drained, organic soil is in depressions, swamps, and marshes. The mapped areas vary considerably in shape and size. Generally, the smaller areas are circular and range from 3 to 15 acres, and the larger areas are very irregular in shape and range from 50 to more than 200 acres. The slopes are smooth to concave and range from 0 to 1 percent.

Typically, the surface layer is black muck about 36 inches thick. The upper part of the underlying material, to a depth of 45 inches or more, is black sand. The lower part, to a depth of 65 inches or more, is dark gray, grayish brown, and gray sand.

Included with this soil in mapping are small areas of Basinger, Hontoon, Placid, and Sanibel soils. In most areas, the included soils make up 10 to 15 percent of the map unit.

The available water capacity of this Samsula soil is high. The permeability is rapid. Under natural conditions this soil is ponded for 6 to 9 months in most years. The water table is at a depth of 10 inches or less for the rest of the year.

Many areas of this soil have been drained for

and are being used to grow caladium bulbs, a specialty crop.

With adequate drainage, this soil has very high potential for production of pasture and hay crops. Pangolagrass, white clover, and bahiagrass are best adapted to this soil. A water control system is needed to maintain the water table near the surface to prevent excess oxidation and subsidence of the organic material. Lime is needed on this soil, and fertilizer that is high in potash and trace elements should also be applied because they are generally deficient in organic soils.

This soil is not suited to citrus or pine trees. Citrus crops can be adapted to this soil if a specially designed water control system is established and maintained to regulate the water table.

The potential of this soil for producing significant amounts of desirable range plants is high. Maidencane and cutgrass are the most desirable. Many areas of this soil provide little or no vegetation that cattle prefer. Those areas that do produce desirable plants provide excellent forage during the winter and during dry periods. Marshes and swamps are additional benefits in a good range management plan. This soil is in the Freshwater Marshes and Ponds range site.

This soil has severe limitations for urban and recreational use. Installing water control systems, removing the organic material, and backfilling with suitable soil material are necessary for most uses.

This Samsula soil is in capability subclass IVw.

**21—Hontoon muck.** This nearly level, very poorly drained, organic soil is in the marshes and swampy areas. Most mapped areas range from 5 to 50 acres,

drained for improved pasture, vegetable crops, and caladium plants and bulbs, a specialty crop. In a few of the larger areas, the muck is being commercially mined. Some areas remain in natural vegetation of sweetbay, blackgum, and other water-tolerant trees. The understory consists of fern, maidencane, sawgrass, and pickerelweed.

This Hontoon soil has very severe limitations for cultivated crops; however, if the soil is drained, a variety of crops are adapted. A properly designed and maintained water control system is required. Fertilizer should be applied according to the need of the crops, and lime should be added to these very acid soils to maintain high quality and obtain maximum yields.

With adequate drainage, hay and pasture crops have very high production potential. Pangolagrass, white clover, and bahiagrass are best adapted to this soil. The water control system should maintain the water table near the surface to prevent excess oxidation and subsidence of the organic material. Lime is needed on this soil, and fertilizer that is high in potash and trace elements should also be applied because these are generally deficient in organic soils.

This soil is not suited to citrus or pine tree production.

The potential of this soil for the production of desirable range plants is high. This soil has the potential for producing significant amounts of maidencane and cutgrass. These marshes produce high quality forage during droughts and during the winter when other areas do not produce a great amount of forage. Management of this native rangeland should include consideration of the number of cattle that use the site for a specific period of time. This soil is in the Freshwater Marshes and Ponds range site.

Included with this soil in mapping are small areas of Gator, Hontoon, Kaliga, and Samsula soils. In places are soils that are similar to Brighton soil, but they are at

**23—Gator muck.** This nearly level, very poorly drained soil is in swamps, marshes, and wet depressions. The mapped areas are irregular in shape and range from 5 to more than 500 acres. The slopes

included soils make up 5 to 10 percent of the map unit.

The available water capacity of this Brighton soil is very high. The permeability is rapid. Under natural conditions, this soil is ponded for 6 to 9 months in most years. The water table is generally at a depth of less than 10 inches the rest of the year but may recede to a depth of more than 10 inches during long, dry periods.

Many areas of this soil have been drained for improved pasture and specialty crops. Many areas remain in natural vegetation of bays, red maple, and other water-tolerant trees and sawgrass, waxmyrtle, arrowhead, pickerelweed, and other aquatic plants.

This Brighton soil has very severe limitations for cultivated crops; however, if the soil is drained, a variety of crops are well suited. A properly designed and maintained water control system is required. Lime is needed to raise the pH for specialty crops and improved pasture. Fertilizer should be added according to the

are smooth to concave and range from 0 to 1 percent.

Typically, the surface layer is black muck about 18 inches thick. The upper part of the underlying material, to a depth of 36 inches, is very dark gray sandy clay loam. The next layer, to a depth of 55 inches, is a stratified layer of dark grayish brown sandy loam and loamy sand. The lower part to a depth of 80 inches or more is a mixture of dark gray and gray sand.

Included with this soil in mapping are small areas of Chobee, Hicoria, and Tequesta soils. In most areas, the included soils make up 10 to 20 percent of the map unit.

The available water capacity of this Gator soil is high. The permeability is slow or very slow. Under natural conditions this soil is ponded for 6 to 9 months in most years. The water table is generally within 10 inches of the surface for the rest of the year.

Most of the larger areas of this soil have been

**24—Pineda sand.** This nearly level, poorly drained soil is on low, narrow to broad flats and in sloughs or poorly defined drainageways in the flatwoods part of the county. The mapped areas are irregular in shape and range from 10 to more than 50 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is dark gray sand about 4 inches thick. The subsurface layer, to a depth of 12

pangolagrass are best adapted to this soil. Management practices should include regular applications of fertilizer, and grazing should be controlled to obtain maximum yields.

The potential of this soil for production of pine trees is moderately high. The main concerns in management are seedling mortality and equipment use limitations during wet periods. Bedding of the trees and a simple

to a depth of 30 inches, is brownish yellow sand. The lower part, to a depth of 56 inches, is light brownish gray sandy clay loam and sandy loam. The substratum to a depth of more than 80 inches is brown and light greenish gray sand.

Included with this soil in mapping are small areas of Basinger, Felda, Malabar, and Valkaria soils. In most

needed if the potential productivity is to be realized. Slash and south Florida slash pines are the preferred trees for planting.

The potential of this soil for the production of desirable range plants is moderate. The grazing sites on this soil are preferred because of the high quality and quantity of forage, such as maidencane, chalky

to 15 percent of the map unit.

The available water capacity of this Chobee soil is moderate. The permeability is slow or very slow. This soil is ponded most of the year. Much of the rest of the year, the water table is at a depth of 10 inches or less. Generally, in dry periods during the winter, it recedes to a lower depth.

Some areas of this soil have been drained for improved pasture, but most areas remain in natural vegetation, which consists of cypress, bays, red maple, and other water-tolerant trees. The understory in marsh areas consists of pickerelweed, arrowhead, waxmyrtle, sawgrass, and other water-tolerant plants.

Under natural conditions, this Chobee soil has very

county. This soil also is along the Kissimmee River flood plain in former oxbows and dendritic patterns leading into the river. Generally, the mapped areas range from 5 to 300 acres, but a few areas are much larger. The slopes are smooth to concave and range from 0 to 2 percent.

Typically, the organic surface layer is black muck about 12 inches thick. Below that layer, to a depth of 17 inches, is black fine sand. The subsurface layer, to a depth of 32 inches, is light brownish gray fine sand. The subsoil, to a depth of 77 inches, is dark gray fine sandy loam. The substratum to a depth of 80 inches or more is light gray fine sand.

Included with this soil in mapping are small areas of

drainage, and unavailability of drainage outlets severely restrict the use of this soil. Cultivated crops can be

areas, the included soils make up 10 to 15 percent of the map unit.

quantity. This soil is in the Freshwater Marshes and Ponds range site.

This soil has severe limitations for most urban and recreational uses. The seasonal high water table and ponding must be considered in the planning and design for the intended use. Special designs, soil reclamation, or planned maintenance after installation should be

plants is very low. The plant community consists of a dense woody understory, which is seldom grazed by cattle. The dominate forage is pineland threeawn. This soil is in the Sand Pine Scrub range site.

This soil has moderate limitations for most urban and recreational uses because of the sandy texture and also because the seasonal high water table is between

This Tequesta soil is in capability subclass IIIw.

**28—Archbold sand, 0 to 5 percent slopes.** This nearly level to gently sloping, moderately well drained soil is on moderately high ridges in the ridge part of the county. The mapped areas are irregular in shape and range from 15 to 75 acres. The slopes are smooth to convex.

Typically, the surface layer is gray sand about 4 inches thick. The underlying material to a depth of 80 inches or more is white sand.

Included with this soil in mapping are small areas of Duette, Orsino, Paola, Pomello, St. Lucie, and Satellite soils. In most areas, the included soils make up 10 to 45 percent of the mapped area.

limitations are easily overcome by special designs and soil reclamation, such as surfacing with suitable topsoil in conjunction with continued maintenance.

This Archbold soil is in capability subclass VI.

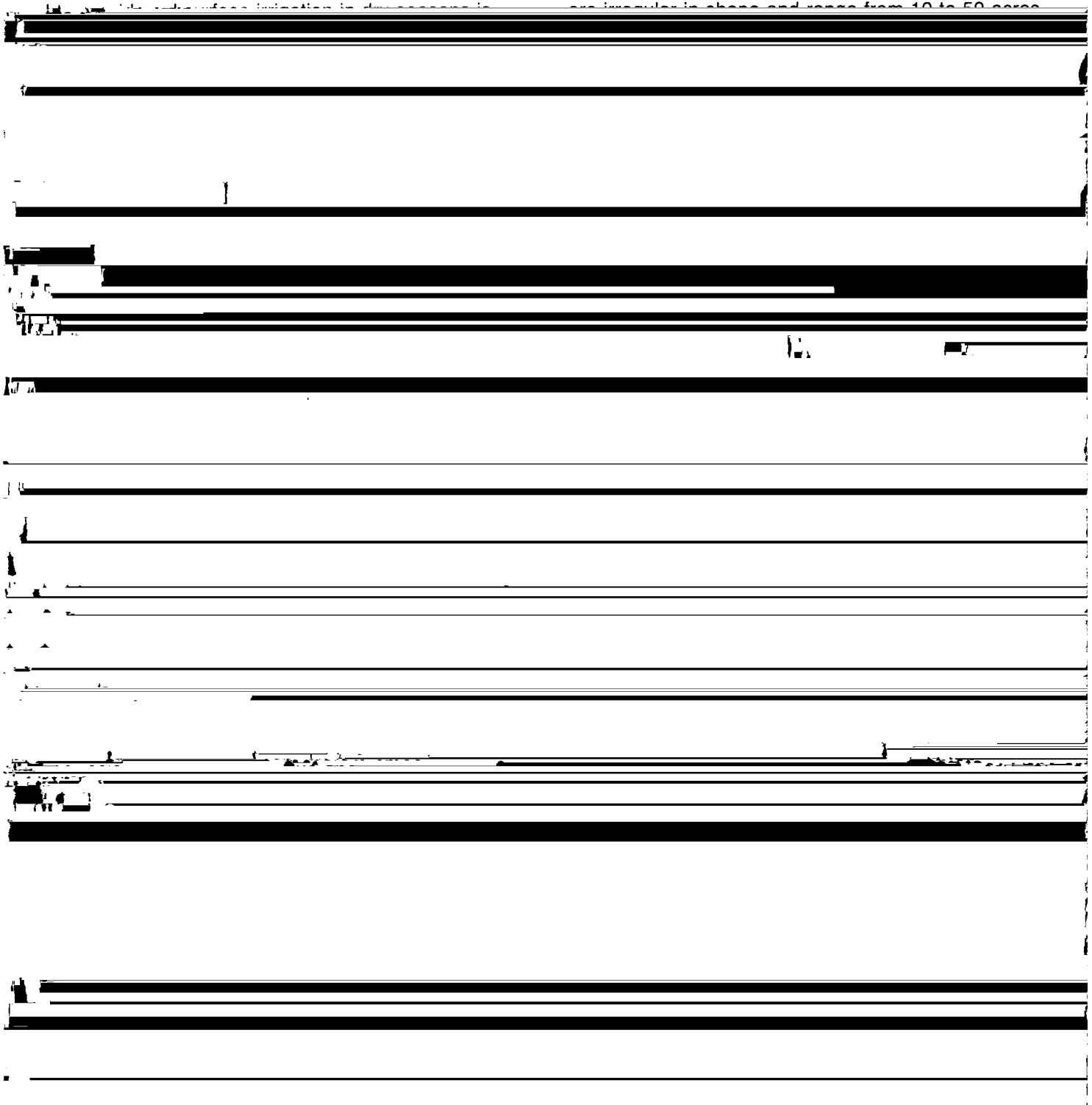
**29—Pomona sand.** This nearly level, poorly drained soil is in the low, flatwood areas that are adjacent to the Hardee County line. The mapped areas are irregular in shape and range from 10 to 50 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is black sand about 6 inches thick. The subsurface layer, to a depth of 29 inches, is gray and light gray sand. The upper part of the subsoil, to a depth of 51 inches, is dark brown and somewhat gravelly brown sand coated with organic



potential of this soil for producing a variety of vegetable crops is moderate. To reach this potential, a water control system to remove excess water in rainy seasons

**30—Oldsmar fine sand.** This nearly level, poorly drained soil is in the flatwood areas that are adjacent to sloughs and streams in the county. The mapped areas



Pangolagrass, bahiagrass, and clover are suited to this soil.

The potential of this soil for production of pine trees

The available water capacity of this Felda soil is low. The permeability is moderately rapid or moderate. This soil is ponded for 6 months or more in most years.

On the boundary with the water table, the water table is

soil is along the Harney Pond Canal, South Florida Water Management Canal, Istokpoga Canal, and various canals dug in the Kissimmee River for flood

Water Conservation District.

This soil has not been assigned a capability subclass.

county wherever major canals for agriculture and lake level water control canals and structures have been installed. These areas vary in size and shape depending on the size of the adjacent canal, and the height is 8 to 25 feet. Areas of Arents are generally smoothed at the top and are used as access roads. The side slopes range from 45 to 65 percent.

The texture and thickness of the layers of this soil are highly variable from site to site. Most areas contain remnants of former soil horizons and shell fragments. A typical profile has a surface layer of olive gray fine sand about 2 inches thick. Below that layer are various layers of fine sand and loamy material from former natural horizons. Colors vary from black, gray, olive brown, to white. Some layers have various amounts of shell fragments.

Included with this soil in mapping are soils in areas along the Kissimmee River that are less than 8 feet thick. These soils are not excessively drained. Generally, these areas are where normal dredge operations did not deposit material thick enough over the existing soil. Also, some areas are mapped Arents in other parts of the county where soil material has been deposited over natural soil. These areas are generally associated with urban land use that elevates

**33—Basinger, St. Johns, and Placid soils.** These nearly level, poorly drained and very poorly drained soils are in seep areas in the county. Locally, they are called cutthroat seeps because of the cutthroat grass that grows vigorously in these areas. Generally, these seep areas are in association with the central ridge in the county. They are the result of water seeping from a higher to a lower position on the landscape. These areas tend to remain wetter for longer periods than similar soils outside the seep areas. The mapped areas range from 50 to more than 1,000 acres. The slopes are dominantly 0 to 2 percent but occasionally range up to 5 percent near the edge of ridges.

The composition of soils in these cutthroat seep areas is highly variable. Similarity of landscape position, land use, and management preclude mapping the soils separately. Some areas contain all three soils while others contain only one of the named soils. The percentage composition is highly variable, although most mapped areas are dominated by one of the major soils.

Typically, the surface layer of Basinger soil is dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of 21 inches, is light gray and light brownish gray fine sand. The subsoil, to a depth of 52 inches, is brown fine sand with many bodies of dark

soils is low. It is moderate in St. Johns soil. The permeability of Basinger and Placid soils is rapid, and it is moderate or moderately slow in the subsoil of St. Johns soil. The soils in this map unit have a water table within 12 inches of the surface most of the year. Interspersed throughout the map unit are shallow depressions that are ponded for several months during the rainy season.

The natural vegetation consists dominantly of cutthroat grass, pineland threeawn, longleaf pine, south Florida slash pine, and slash pine. Other vegetation in some areas includes St. Johnswort, waxmyrtle, creeping bluestem, fetterbush, gallberry, maidencane, and saw palmetto and bay trees.

The soils in this map unit have severe limitations for cultivated crops; however, crops are well suited to these soils if good drainage is provided. Fertilizer and lime should be added according to the needs of the crop.

These soils are poorly suited to citrus trees; however, if a well designed water control system is installed,

#### **34—Tavares-Basinger-Sanibel complex, rolling.**

This complex consists of nearly level to rolling, moderately well drained soils on ridgetops and side slopes and poorly drained and very poorly drained soils in sloughs and depressional areas. The slopes are 2 to 12 percent in the upland areas and are less than 2 percent in the depressions and sloughs.

Tavares soil makes up most of this map unit and is on ridgetops and in the upland areas of the map unit. Sanibel soil dominates the depressional areas, and Basinger soil is in the sloughs and in some depressions. This map unit is only in the easternmost part of the ridge bounded on the south by the Seaboard Coast Railway and on the north by Arbuckle Creek Road.

Tavares soil makes up 60 percent of this map unit. Basinger soil makes up 20 percent, Sanibel soil makes up about 10 percent, and the included soils make up about 10 percent. The individual areas of these soils are too mixed or too small to map separately at the

Basinger soils and moderate to high in Sanibel soils.

The natural vegetation on the Tavares soil consists of slash and longleaf pines, turkey oak, hickory, sand live oak, scattered saw palmetto, and pineland threawn. The dominant vegetation on Basinger and Sanibel soils is maidencane, pickerelweed, arrowhead, redroot, and St. Johnswort.

Most of the soils in this map unit remain in natural vegetation but have been dissected by roads and ditches for an urban subdivision development. One large area has been planted to citrus crops. As the intended use of the land is for urban development, this would preclude its use for cultivated crops, improved

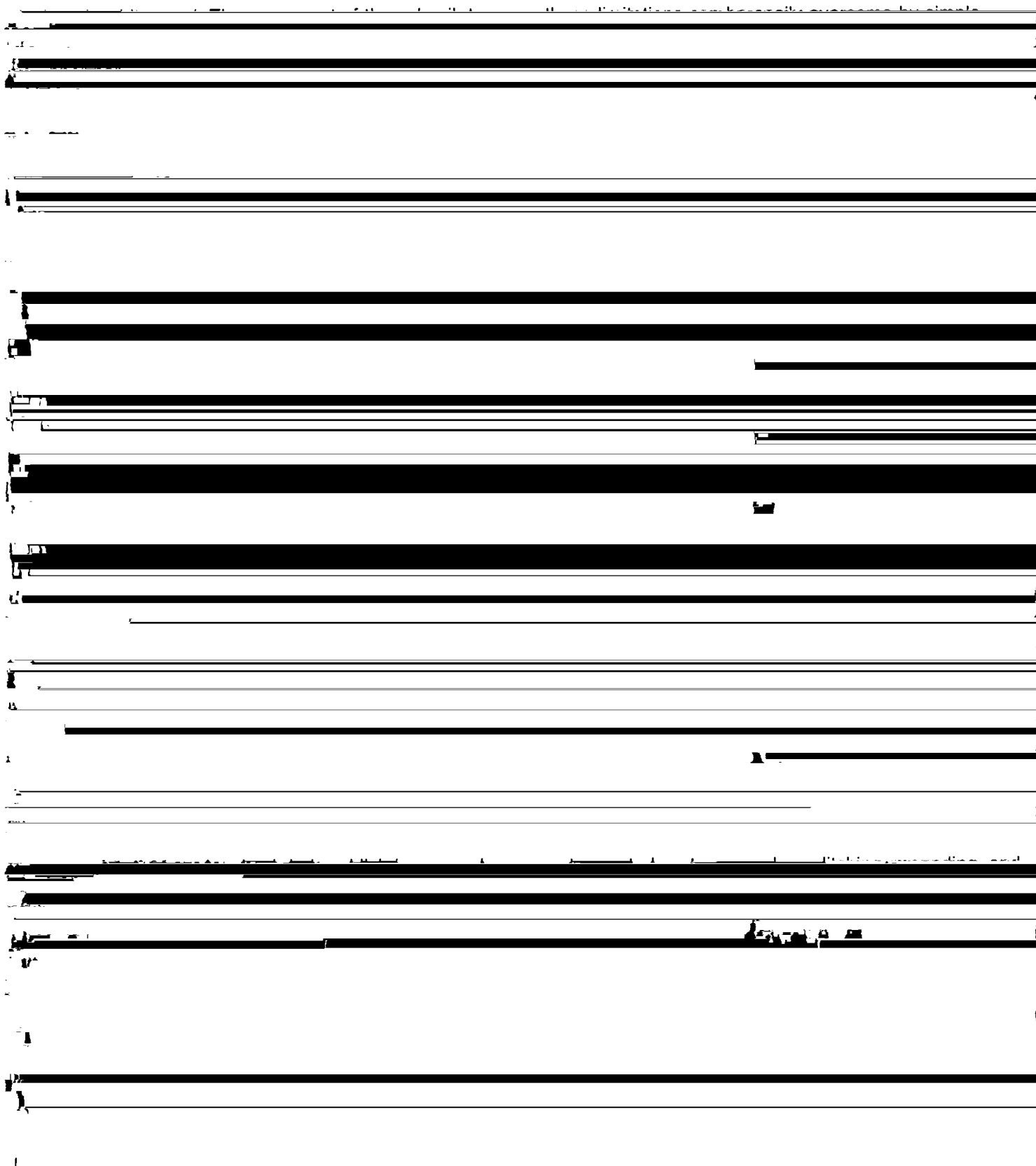
A large acreage of this soil has been cleared and drained for improved pasture. Many small areas remain in natural vegetation, which consists of cypress and other water-tolerant trees and pickerelweed, maidencane, and other water-tolerant grasses.

This Sanibel soil has very severe limitations for cultivated crops; however, if the soil is drained, a variety of crops can be grown. A properly designed water control system must be established and maintained. Lime is essential, and fertilizer should be added according to the need of the crops to obtain high yields.

With adequate drainage, this soil has very high potential for production of pasture and hay crops. Very

The soils in this map unit have variable limitations for urban and recreational uses, depending upon the soil type, slope, and position on the landscape. The information provided is not intended to be used as site specific but only as general information. Each area

bahiagrass, and St. Augustine are possible with proper fertilization. Fertilizer that contains phosphates, potash, and trace elements is needed. Proper liming practices are also critical when establishing improved pastures. Water should be controlled to maintain the water table



management is practiced, the potential of this soil for  
excess moisture stress is moderate

summer rainy period. During the rest of the year, it is at  
a depth of 12 to 40 inches. A perched water table

wetness and the sandy texture. Problems associated with wetness can be corrected by providing adequate drainage and drainage outlets to control the high water table. The sandy texture limitation can be overcome by adding suitable topsoil or by resurfacing the area.

This EauGallie soil is in capability subclass IVw.

**39—Smyrna sand.** This nearly level, poorly drained soil is on the broad flatwoods in the county. The mapped areas are irregular in shape and range from 20 to 500 acres. The slopes are smooth and range from 0

surface to help control erosion.

Citrus trees are moderately well suited to this soil if a properly designed water control system is established and maintained. The system should be designed to maintain the water table at an effective depth. Irrigation water should be available during dry periods. Regular applications of fertilizer and lime are needed.

The potential of this soil for production of pasture and hay crops is moderate. Bahiagrass, pangolagrass, and white clover are best suited to this soil. Surface drainage is needed to remove excess surface water

Typically, the surface layer is dark gray sand about 5 inches thick. The subsurface layer, to a depth of 15 inches, is light gray fine sand. The subsoil, to a depth of about 35 inches, is black, dark brown, and brown fine sand. The upper part of the substratum, to a depth of 45 inches, is light yellowish brown fine sand. The middle part, to a depth of 56 inches, is light gray fine sand. The lower part to a depth of 80 inches is white sand.

Included with this soil in mapping are small areas of Basinger, Immokalee, Myakka, Placid, and Valkaria soils. In most areas, the included soils make up 10 to 20 percent of the map unit.

The available water capacity of this Smyrna soil is low. The permeability is moderate or moderately rapid.

lime and fertilizer are needed. Grazing should be controlled to prevent overgrazing and weakening of plants.

The potential of this soil for production of pine trees is moderately high. Equipment use limitations, seedling mortality, and plant competition are concerns in management. Trees should be planted in bedded rows. Slash and south Florida slash pine are the preferred trees for planting.

The potential of this soil for the production of range plants is moderate. This soil has the potential for producing significant amounts of creeping bluestem, chalky bluestem, indiagrass, various panicums, and numerous legumes and forbs. Grazing should be controlled to maintain plant vigor; if not, the range will



loamy material or former subsoils that are made up of  
massive better sorted sand grains are mixed throughout

Basinger soil is poorly drained. Typically, the surface  
layer is dark gray fine sand about 6 inches thick. The

**Figure 5.—Urban development and citrus crops are competing land uses on Astatula soil in this area of Astatula-Urban land complex, 0 to 8 percent slopes.**

included soils make up 20 to 50 percent of the map unit. The individual areas of Astatula soil and of Urban land are too mixed or too small to map separately at the selected scale.

Typically, Astatula soil has a surface layer of dark grayish brown sand about 8 inches thick. The underlying material to a depth of 80 inches is brownish yellow sand.

The Urban land part of this map unit is covered by roads, houses, driveways, and other urban structures.

Included in mapping are small areas of Archbold, Daytona, Duette, Orsino, Paola, St. Lucie, and Tavares soils.

The available water capacity of this Astatula soil is

very low. The permeability is very rapid. The water table is at a depth of more than 72 inches.

Present land use precludes the use of this map unit for cultivated crops, citrus crops, improved pasture, rangeland, or pine trees. The potential of these soils in existing open spaces is high for most urban uses; however, lawns, gardens, and ornamentals will require supplemental irrigation and fertilization because of the droughty nature of these soils and their low natural fertility. If the surface soil has been removed, additions of a good quality topsoil may be needed for vigorous plant growth.

The soils in this map unit have not been assigned to a capability subclass.

**43—Urban land.** Urban land consists of areas that are 75 percent or more covered with streets, buildings, parking lots, shopping centers, industrial areas, airports, and other urban structures. Small areas of undisturbed soils are mostly in lawns, vacant lots, playgrounds, and green areas. The original soil in some areas has been altered by filling, grading, and shaping. Urban land is nearly level except for some parking areas that are sloped to drain off water. The mapped areas range from about 5 to 100 acres. The slopes range from 0 to 2 percent.

Included in mapping are Archbold, Astatula, Satellite, and Tavares soils. These areas are too small to delineate separately.

Urban land will remain in its present use; therefore, no other uses are rated.

Urban land has not been assigned a capability subclass.

**44—Satellite-Basinger-Urban land complex.** This complex consists of nearly level, somewhat poorly drained Satellite soil and poorly drained Basinger soil and areas of Urban land. The slopes range from 0 to 2 percent.

This map unit consists of about 20 to 60 percent Satellite soil, 5 to 25 percent Basinger soil, and 15 to 55 percent Urban land. In a few small areas, Urban land makes up more than 55 percent of the map unit. The individual areas of the soils in this map unit are too mixed or too small to map separately at the selected scale.

Typically, Satellite soil has a surface layer of dark gray sand about 4 inches thick. The subsoil to a depth of more than 80 inches is white fine sand.

Typically, Basinger soil has a surface layer of dark gray fine sand about 6 inches thick. The subsurface layer, to a depth of about 21 inches, is light gray and light brownish gray fine sand. The subsoil, to a depth of 52 inches, is brown fine sand. The upper part of the substratum, to a depth of 62 inches, is light brownish gray fine sand. The lower part to a depth of 80 inches is grayish loamy fine sand.

The Urban land part of this complex consists of housing developments, recreational areas, shopping centers and other urban structures. Openland areas are mainly lawns, playgrounds, and vacant lots.

Included in mapping are small areas of Archbold, Immokalee, Myakka, and Placid soils.

The available water capacity of this Satellite soil is very low. The permeability is very rapid. The water table is at a depth of 12 to 40 inches for periods of 2 to 6 months.

The available water capacity of this Basinger soil is very low. The permeability is rapid. The water table is within 12 inches of the surface for 2 to 5 months during the summer rainy season. Generally, the water table is between depths of 12 and 40 inches for 6 months or more but may recede to a lower depth during extended dry periods.

Present land use precludes the use of these soils for cultivated crops, citrus crops, pasture, or commercial woodland. The open part of the map unit is used for lawns, gardens, ornamentals, and open space. For maintaining lawns and plants in good condition, regular applications of fertilizer and supplemental irrigation are needed. A water control system is necessary to remove excess surface water from Basinger soil during periods of high rainfall. Because of the complexity of these areas and severe water problems affecting the urban uses of these soils, it is suggested that a site specific investigation be conducted to determine suitability for the intended use. Assistance in conducting this investigation can be obtained by contacting the Highlands Soil and Water Conservation District.

The soils in this map unit have not been assigned to a capability subclass.

**45—Paola-Basinger sands, rolling.** This highly pitted complex consists of nearly level to rolling, excessively drained soils on side slopes and ridgetops and poorly drained to very poorly drained soils in small depressional areas. The slopes are smooth to convex on the ridges and concave in the depressions and range from 0 to 12 percent. Basinger soil ranges from less than 1 acre to more than 10 acres, and Paola soil makes up the remaining acres in the map unit. This map unit is only in one area on the southeastern side of the ridge between Lake Placid and Florida State Highway 70.

Paola soil makes up 60 to 75 percent of this map unit. Basinger soil makes up 5 to 20 percent. The included soils make up 5 to 35 percent. The individual areas are too mixed or too small to map separately at the selected scale.

Paola soil has slopes of 2 to 12 percent. Typically, this soil has a surface layer of gray sand about 7 inches thick. The subsurface layer, to a depth of 17 inches, is light gray sand. The subsoil, to a depth of 27 inches, is very pale brown sand. The substratum to a depth more than 80 inches is yellowish brown and yellow sand.

Basinger soil is in the pitted or depressional areas. Typically, the surface layer of this soil is dark gray fine sand about 6 inches thick. The upper part of the subsurface, to a depth of 16 inches, is light gray fine

sand. The lower part, to a depth of 21 inches, is light brownish gray fine sand. The subsoil, to a depth of 52 inches, is brown fine sand. The upper part of the substratum, to a depth of 62 inches, is light brownish gray fine sand. The lower part to a depth of more than 80 inches is grayish brown loamy fine sand.

Included in mapping are Astatula, Myakka, Orsino, Placid, St. Lucie, and Satellite soils. Placid soil makes up about 30 percent of the part described as Basinger soil. In places are soils in areas that are ponded throughout the year and soils in areas that have 12 to 20 percent slopes. Most of this map unit is in an urban subdivision; consequently, many areas have been altered by cutting, filling, or smoothing for present and future development.

The available water capacity of Paola soil is very low. The permeability is very rapid. The water table is at a depth of more than 72 inches throughout the year.

The available water capacity of Basinger soil is low. The permeability is rapid. The water table is at a depth of less than 12 inches during the summer rainy season. Some areas are ponded for a short period after heavy rainfall. The high water table impedes internal drainage.

The natural vegetation on Paola soil consists of sand and slash pines, turkey oak, myrtle oak, Chapman oak, sand live oak, pignut hickory, scattered saw palmetto, and *Adiantum* species. The natural vegetation on the

**46—Kaliga muck, frequently flooded.** This nearly level, very poorly drained soil is on a long, narrow flood plain that is adjacent to the streambed on Arbuckle Creek. The mapped areas range from 25 to more than 100 acres. The slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is black muck about 6 inches thick. Below that layer, to a depth of 39 inches, is dark brown muck. The upper part of the underlying material, to a depth of 45 inches, is a thin layer of grayish brown very fine sand. The next layer, to a depth of 68 inches, is dark gray very fine sandy loam. The lower part to a depth of 80 inches is grayish brown very fine sand.

Included with this soil in mapping are small areas of Basinger, Felda, Hicoria, Samsula, Sanibel, and Tequesta soils. In most areas, the included soils make up 15 to 35 percent of the map unit.

The available water capacity of this Kaliga soil is very high. The permeability is slow or very slow. The seasonal high water table is at a depth of less than 12 inches for very long periods in most years. These soils are subject to flooding for long periods during seasons of high rainfall. The flooding results in deposition and removal of sediment and debris. In the lowest areas on the flood plain, the muck is generally thicker. On higher

This soil is very poorly suited to urban or recreational development because of flooding, wetness, and low soil

strength. Overcoming these hazards and limitations are expensive and impractical.

This Kaliga soil is in capability subclass VIIw.



## Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural

is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of

soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion

Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given

**Figure 6.—This improved pasture of bahiagrass on Oldsmar fine sand offers good grazing for the cattle.**

clover is the major cool-season legume. Warm-season legumes include perennials, such as carpon desmodium and phasey bean, and annuals, such as aeschynomene, hairy indigo, and alyce clover.

Some introduced plants are not adapted to Florida's natural environment; consequently, the environment must be modified to compensate for the introduced plants' shortcomings and to insure their survival and optimum performance. Environmental modifications include water control, such as drainage and irrigation, and soil amendments, such as fertilization and pH adjustment. Rotation grazing is needed to provide adequate rest periods during the growing season for the forage to reproduce and replenish root reserves. This

periodic rest period insures a healthy, productive, and nutritious forage.

The prevalence of weeds and brush indicates the need for improved management. In addition, other common problems are excessive or inadequate moisture, low fertility or pH, uncontrolled grazing, or improper plants selection.

Pasture is used to produce forage for beef and dairy cattle. Commercial cow-calf operations are the major livestock enterprises. These beef-cattle operations range from several hundred animals to a hundred animals or less. Large operations generally depend upon a combination of rangeland and improved, or introduced, perennial plants for forage, while the small



operations generally use only improved pasture plants.

In recent years, the higher cost of fertilizer and equipment has slowed the conversion of rangeland to pastureland. Some Florida ranchers, aware of the value of the native grasses, have moved from the intensive agronomic management approach to a more ecologically-based management of native grasses.

Pomello and Tavares soils are moderately suited to bahiagrass, improved bermudagrass, and pangolagrass. With good management, hairy indigo, alsike clover, and aescynomene can be grown in summer and fall. Satellite soil is moderately suited to bahiagrass, improved bermudagrass, and legumes, such as sweet clover, but adequate amounts of lime and fertilizer must be applied.

If drained, Basinger, Bradenton, EauGallie, Felda, Immokalee, Malabar, Myakka, Oldsmar, Pineda, Smyrna, and Valkaria soils are well suited to pastures of bahiagrass and hermarthria grass. Subsurface irrigation increases the length of the growing season and the total forage production. Legumes, such as white clover, are well suited to these soils if adequate amounts of lime and fertilizer are added.

The very poorly drained soils, such as Anclote, Chobee, Gator, Hicoria, Placid, and Samsula soils, are very wet during rainy periods. In most areas, water stands on the surface, and the production of pasture of good quality is not possible unless artificial drainage is used.

The design of surface drainage and subsurface irrigation systems varies with the kind of soil and the forage species. For intensive pasture production, a combination of these systems is needed. Information on the drainage and irrigation needed for each kind of soil is available at the local office of the Soil Conservation Service.

In some parts of the county, pasture is greatly depleted by excessive grazing. Yields of pasture are increased mainly by good grassland management and by adding lime and fertilizer. Differences in the amount and kind of pasture yields are closely related to the kind of soil. Management of pasture is based on the relationship of soils, pasture plants, lime, fertilizer, moisture, and management.

The latest information about pasture can be obtained from local offices of the Soil Conservation Service and the Cooperative Extension Service.

## Crops

The major crop in Highlands County is citrus. Other crops are vegetables and specialty crops.

Most of the soils used for crops in Highlands County

have a sandy surface layer that is low to moderate in content of organic matter. The exceptions are Anclote, Brighton, Chobee, Gator, Hicoria, Hontoon, Placid, Samsula, Sanibel, and Tequesta soils. Anclote, Chobee, Hicoria, and Placid soils have a sandy, dark surface layer that is high in content of organic matter. Brighton, Gator, Hontoon, Tequesta, Sanibel, and Samsula soils are organic soils and have an organic surface layer. Generally, the structure of the surface layer of most soils in the county is weak. Most of the moderately well drained soils and the somewhat poorly drained Satellite soils are low in content of organic matter and are droughty. Returning crop residue to the soil and planting cover crops will improve soil structure and increase the available water capacity of the soil.

If irrigated, Astatula, Paola, and Tavares soils are very well suited to citrus crops. If adequately drained, Basinger, Bradenton, EauGallie, Felda, Immokalee, Malabar, Myakka, Oldsmar, Pineda, Smyrna, and Valkaria soils are well suited to vegetable crops and citrus crops. Soils in low areas where air drainage is poor and frost pockets are common, generally are poorly suited to early vegetables, small fruits, and citrus crops.

Field crops are grown on a small acreage in Highlands County. The acreage of corn, grain sorghum, sunflowers, and sugarcane can be increased if economic conditions warrant. Rye is the common close-growing crop.

The specialty crops that are grown commercially are citrus, watermelons, tomatoes, cucumbers, caladiums, nursery plants, and sod. If economic conditions are favorable, the acreage of nursery plants and sod can be increased.

The latest information for growing specialty crops can be obtained from the local office of the Cooperative Extension Service or the Soil Conservation Service.

*Soil erosion* by water is not a serious problem in Highlands County. Erosion generally is a hazard on the more sloping soils if the surface is not protected by a cover of vegetation. Loss of the surface layer through erosion is damaging because productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. This loss is damaging also because soil erosion on farmland results in sedimentation of streams. Controlling erosion minimizes the pollution of streams by sediment and improves the quality of water for municipal use, for recreation, and for fish and wildlife.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration. A cropping system that keeps a vegetation cover on the

soil for extended periods can hold soil losses to an amount that will not reduce the productive capacity of the soils. On livestock farms, which require pasture and hay, the legumes and grass forage crops in the

county. Most of the soils have a sandy surface layer and are a light color. Bradenton, Felda, Malabar, and Pineda soils have a loamy subsoil. Anclote, Astatula, Satellite, Tavares, and Valkaria soils have sandy material to a depth of 60 inches or more. Bradenton

of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 3 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

### Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major, and generally expensive, landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

*Capability classes*, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows, but in this survey, there are no Class I, II, V, or VIII soils.

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

*Capability subclasses* are soil groups within one class. They are designated by adding a small letter, w, or s, to the class numeral, for example, IIIw. The letter w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); and s shows that the soil is limited mainly because it is shallow, droughty, or stony.

The acreage of soils in each capability class and subclass is shown in table 4. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

### Rangeland

Thomas Edward Sievers, range conservationist, Soil Conservation Service, assisted in preparing this section.

Rangeland is land on which the natural vegetation is predominantly native grasses, grasslike plants, forbs, or shrubs suitable for grazing by domestic livestock or wildlife. In addition to livestock forage and wildlife habitat, rangeland provides wood, water, recreation, and scenic beauty. Rangeland includes grassland, open forest, wetland, and shrubland.

Rangeland was once more prevalent throughout Highlands County, and numerous ranching enterprises prospered from the abundant native forage. Common grazing practices that were previously used unwittingly lead to the degradation of rangeland productivity. The obvious solution was the conversion of rangeland into pastureland of introduced or nonindigenous grasses and legumes. Rangeland now covers 269,243 acres of the county (14).

Rangeland differs in the species composition and

they tend to dominate the climax plant community. Less adapted species are only minor components. Human activities that drastically deviate from the natural precedence, such as excesses of grazing, burning, or drainage, will alter the balance between plant species and will change the complexion of each range site impacted.

Native plants can be divided into three groups based on their response to continual heavy grazing—decreasers, increasers, and invaders.

*Decreasers* are the most palatable plants; consequently, they are the first to decline under continual heavy grazing. Decreasers are generally the best adapted and most productive species.

*Increasers* are less palatable to livestock. They

suppressed, removes rank forage, returns nutrients to the soil, and reduces the hazard of wildfire. Excessive burning more frequently than every third year can be detrimental to climax plant communities.

### Range Sites

The soils in Highlands County have been grouped into seven range sites. The following descriptions of each range site gives important soil characteristics, production potential, species composition, and specific concerns of management.

**South Florida Flatwoods.**—This range site consists of nearly level, poorly drained, coarse textured soils. Many of these soils have organic pans. The water table fluctuates during the year and may rise to the surface

increase initially as the decreasers are eliminated, but they also eventually decrease.

*Invaders* have very little forage value so they tend to increase and become more dominant plants as the

during the rainy season. The common flatwoods soils are Myakka and Immokalee soils. The flatwoods are Highlands County's most common range site and are

Placid fine sand, depressional, soils, are mineral. Maidencane and cutgrass are the most important decreaseers. Sand cordgrass and carpetgrass are common invaders. Marshes in excellent condition can produce 10,000 pounds per acre of palatable range forage per year. Marshes in poor condition produce about 2,000 pounds per acre of herbage per year.

Freshwater marshes and ponds are the most productive range sites in Highlands County. Maidencane and cutgrass grown on organic soils are superior in quality and quantity to other native grasses; however, the inundation and softness of organic soils can limit summer grazing. Maidencane and cutgrass are prone to die back following freezing temperatures; consequently, spring and fall provide the best grazing opportunities.

**Slough.**—This range site is on nearly level, poorly drained, coarse textured soils. Basinger is the most common slough soil. Topographically, sloughs are positioned between the flatwoods and marshes. Sloughs serve as drainageways through the flatwoods that often connect and ring the marshes. Blue maidencane is the major decreaseer grass. Toothachegrass and hairy bluestem are other important decreaseer grasses. Wiregrass, St. Johnswort, waxmyrtle, sedges, and rushes are the most common invaders. Sloughs in excellent condition produce an average of 6,000 pounds per acre, per year. Sloughs in

invaders. This range site in excellent condition will produce about 3,000 pounds of herbage per acre, per year. Most of the Longleaf Pine-Turkey Oak Hills range sites have been converted to citrus crops or urban development use.

**Cutthroat Seep.**—This range site is on nearly level, poorly drained and very poorly drained soils in seep areas. Cutthroat seeps are situated below the Sand Pine Scrub and the Longleaf Pine-Turkey Oak Hills range sites and above the flatwoods. Longleaf or slash pines dominate the overstory. Creeping bluestem, chalky bluestem, and toothachegrass are the major decreaseer grasses. Cutthroat grass is the dominant increaseer grass. Cutthroat seeps in excellent condition will produce about 7,500 pounds per acre, per year of forage. Cutthroat Seeps provide good winter grazing because cutthroat grass and the bluestems remain green for grazing and cover.

**Wetland Hardwood Hammock.**—This range site is on a poorly drained, coarse textured, calcareous soil, namely Bradenton. The density of hardwoods and cabbage palm overstory can limit forage production on this site. Other tree species include live oak, laurel oak, red maple, and blackgum. Longleaf uniola, switchgrass, and eastern gamagrass are the major decreaseer grasses.

Table 5 shows, for each soil, the range site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation;

expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture.

*Dry weight* is the total annual yield per acre of air-dry vegetation. Yields are adjusted to a common percent of air-dry moisture content. The relationship of green weight to air-dry weight varies according to such factors as exposure, amount of shade, recent rains, and unseasonable dry periods.

*Characteristic vegetation*—the grasses, forbs, and shrubs that make up most of the climax plant community on each soil—is listed by common name. Under *composition*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the potential climax plant community. It also requires an evaluation of the present range condition. Range condition is determined by comparing the present plant community with the potential climax plant community on a particular range site. The more closely the existing community resembles the climax community, the better the range condition. Range condition is an ecological rating only. It does not have a specific meaning that pertains to the present plant community in a given use.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the climax plant community for that site. Such management generally results in the optimum production of vegetation, reduction of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, a range condition somewhat below the potential meets

the county, which was previously wooded, has been converted for pasture use.

Three major types of woodlands in the county support different forest communities. Approximately one-third of the woodlands is composed of the slash pine-longleaf pine type. These forests typically grow on the flatwoods and are the most important type economically. These trees are used for fence posts, pulpwood, and sawtimber. Fully stocked forests on these sites can be expected to produce 1 to 1.5 cords of wood annually.

About 18,000 acres of sand pine, oak-pine, and oak-hickory forests are on the higher sand ridges in the county. These woodlands do not have an economic value but are important for their wildlife value. Because these sites are favored for development, these forest communities and their associated wildlife species are becoming increasingly rare.

The remaining forest land is made up of the oak-gum-cypress type. These forests are in, or are adjacent to, freshwater swamps along drainage systems and lakes. Although cypress has a minor economic value, this forest type is most valuable for the wildlife that inhabit the forests and for the water resources they protect.

Historically, forest land in the county has not been protected. Private development, conversion to pastureland, and damage from wildfires have all reduced the woodland acreage. However, wherever forests are protected from fire, the slash, and longleaf pine forests have reestablished themselves.

Some markets for forest products are in the county. Fence-post and sawtimber sales are relatively steady, but pulpwood sales can be erratic. In 1984, the estimated primary income from forest land was 421,937 dollars. Management generally consists of protection of natural stands, the use of prescribed fire, and periodic harvests. A notable exception is the Air Force's Avon Park Air Force Range in the northeastern part of the county, which manages over 10,000 acres of planted and natural slash and longleaf pines mainly as

others, and some are more susceptible to erosion after roads are built and timber is harvested. Some soils require special efforts to reforest. In the section "Detailed Soil Map Units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. The common forest understory plants are also listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight*, *moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

The first tree listed for each soil under the column "Common trees" is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the ordination symbol, a letter, indicates the major kind of soil limitation for use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes

if soil wetness restricts equipment use from 2 to 6 months per year or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if soil wetness restricts equipment use for more than 6 months per year or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

Ratings of *seedling mortality* refer to the probability of death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall as influenced by kinds of soil or topographic features. *Seedling mortality* is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth and duration of the water table, and rooting depth. Mortality generally is greatest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if, expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing surface drainage, or providing artificial shade for seedlings. Reinforcement planting is often needed if risk is *moderate* or *severe*.

Ratings of *windthrow hazard* consider the likelihood

a significant limitation. The letter *S* indicates a dry, sandy soil. If a soil has more than one limitation, the priority is as follows: *W* and *S*.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation activities or harvesting operation expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of *moderate* or *severe* indicate the need for construction

of trees being uprooted by the wind. Restricted rooting depth is the main reason for windthrow. Rooting depth can be restricted by a high water table, fragipan, or bedrock, or by a combination of such factors as soil wetness, texture, structure, and depth. The risk is *slight* if strong winds cause trees to break but do not uproot them; *moderate* if strong winds cause an occasional tree to be blown over and many trees to break; and *severe* if moderate or strong winds commonly blow trees over. Ratings of *moderate* or *severe* indicate the need for care in thinning or possibly not thinning. Specialized equipment may be needed to avoid damage

maintenance. The risk is *moderate* if competition from undesirable plants reduces natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The potential productivity of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence.

Generally, only two or three tree species dominate.

The soils that are commonly used to produce timber

rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To insure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Additional information on planning windbreaks and screens and on planting and caring for trees and shrubs can be obtained from local offices of the Soil Conservation Service or the Cooperative Extension



recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 7, the degree of soil limitation is expressed

## Wildlife Habitat

John Vance, biologist, Soil Conservation Service, helped to prepare this section.

Wildlife is a valuable resource of Highlands County. The wetland areas and native rangelands along the

can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset by soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 7 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 10 and interpretations for dwellings without basements and for local roads and streets in table 9

Creek, and Fisheating Creek provide particularly valuable habitat. The 3,700 acre Archbold Research Station, the 3,500 acre Highlands Hammock State Park, and the 51,000 acre Avon Park Bombing Range are especially important.

The primary game species include white-tailed deer, squirrel, wild turkey, bobwhite quail, feral hogs, and waterfowl. Nongame species include raccoon, rabbit, armadillo, opossum, skunk, bobcat, gray fox, otter, mink, and a variety of songbirds, wading birds

various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining

Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, maple, gallberry, saw palmetto, huckleberry, hickory, and blackberry.

of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or

properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine and cypress.

*Wetland plants* are annual and perennial, wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, and reaction. Examples of wetland plants are smartweed, wild millet, pickerelweed, arrowhead, cordgrass, rushes, sedges, and reeds.

maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Table 9 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply

of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to a high water table, flooding, and slope affect the ease of excavating and grading. Soil

### Sanitary Facilities

Table 10 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and

of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf

soil properties or site features are somewhat restrictive for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the

required to minimize seepage and contamination of ground water.

Table 10 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, flooding, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems.

*Sanitary landfills* are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 10 are based on soil properties, site features, and observed performance of the soils.

material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

### Construction Materials

Table 11 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good*, *fair*, or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

*Roadfill* is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not

potential, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

*Sand and gravel* are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 11, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

*Topsoil* is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant-available nutrients as it decomposes.

### Water Management

Table 12 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are somewhat restrictive for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable for the intended use that special design and possibly increased maintenance or alteration are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

*Pond reservoir areas* hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to permeable material. Excessive slope can affect the storage capacity of the reservoir area.

*Embankments, dikes, and levees* are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high

content of organic matter. A high water table affects the amount of usable material. It also affects trafficability.

*Aquifer-fed excavated ponds* are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and the salinity of the soil.

*Drainage* is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; and subsidence of organic layers. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone. Availability of drainage outlets is not considered in the ratings.

*Irrigation* is the controlled application of water to

supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The performance of a system is affected by the depth of the root zone and soil reaction.

*Terraces and diversions* are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope and wetness affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

*Grassed waterways* are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, and restricted permeability adversely affect the growth and maintenance of the grass after construction.





# Soil Properties

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Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain size distribution, plasticity,

in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

*Classification* of the soils is determined according to the Unified soil classification system (2) and the system adopted by the American Association of State Highway and Transportation Officials (1).

The Unified system classifies soils according to

in parentheses, is given in table 20.

root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil

indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

structure.

*Permeability* refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil

change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

*Erosion factor K* indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the

carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 20 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition.

potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. Some of the soils in table 15 have two hydrologic groupings, a B/D listing means that under natural conditions this soil would be in Group D,

The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 15 are the depth to the seasonal high water table; the kind of water table, that is, *apparent*; and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 15. Table 16 shows water table data of several

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Dr. Victor W. Carlisle, professor of Soil Science, and Dr. W. G. Harris, assistant professor of Soil Science, University of Florida, Agricultural Experiment Station, Soil Science Department, prepared this section.

Parameters for physical, chemical, and mineralogical properties or representative pedons sampled in Highlands County are presented in tables 17, 18, and 19. The analyses were conducted and coordinated by the Soil Characterization Laboratory at the University of Florida. Detailed profile descriptions of the analyzed

Electrical conductivity determinations were made with a conductivity bridge on 1:1 soil to water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry. Aluminum, carbon, and iron were extracted from probable spodic horizons with 0.01 molar sodium pyrophosphate. Determination of aluminum and iron was by atomic absorption and of extracted carbon was by the Walkley-Black wet combustion method.

Mineralogy of the clay fraction less than 2 microns was ascertained by x-ray diffraction. Peak heights at 18 angstrom, 14 angstrom, 10 angstrom, 7.2 angstrom,

1. The first step in the process is to identify the problem or issue that needs to be addressed. This involves gathering information and understanding the context of the problem.

2. Once the problem is identified, the next step is to define the objectives and goals of the project. This helps to clarify what needs to be achieved and provides a clear direction for the team.

3. The third step is to develop a plan or strategy to address the problem. This involves breaking down the problem into smaller, manageable tasks and determining the resources needed to complete each task.

4. The fourth step is to implement the plan. This involves putting the strategy into action and monitoring progress regularly to ensure that the project is on track.

5. Finally, the fifth step is to evaluate the results of the project. This involves assessing the outcomes against the objectives and goals to determine the effectiveness of the project and identify areas for improvement.

retain very low amounts of available water for plants. Conversely, soils with a higher amount of fine textured materials and a higher content of organic matter, such as Chobee fine sandy loam and Hicoria mucky sand, retain much larger amounts of available water for plants.

## Chemical Properties

Observations on the literature (Table 40) show that a wide

EauGallie, Felda, Immokalee, Orsino, Paola, Placid, Pomello, St. Lucie, Satellite, Tavares, and Valkaria soils contained horizons that had nondetectable amounts of potassium.

Values for cation-exchange capacity, an indicator of plant nutrient capacity, exceeded 10 milliequivalents per hundred grams in the surface horizon of Bradenton, Chobee, Hicoria, and Placid soils. Enhanced cation-exchange capacities paralleled the higher clay contents occurring in the deeper horizons of Bradenton, Chobee, EauGallie, Felda, Hicoria, and Malabar soils. Soils with low cation-exchange capacity in the surface horizon,

horizons. Pyrophosphate extractable iron and aluminum ratio to citrate-dithionite extractable iron and aluminum was sufficient to meet spodic horizon criteria for all spodosols. Sodium pyrophosphate extractable iron was less than 0.02 percent for all of these soils except Daytona soil, which contained 0.26 percent extractable iron.

Citrate-dithionite extractable iron in the Bt horizon of Bradenton, Chobee, EauGallie, Felda, Hicoria, and Malabar soils ranged from 0.08 to 0.84 percent and was generally less than 0.30 percent. Aluminum extracted by citrate-dithionite from the Bt horizon in these soils

only small amounts of lime or sulfur to significantly alter both the base status and soil reaction. Generally, soils of low inherent soil fertility are associated with low values for extractable bases and low cation-exchange capacity. Fertile soils are associated with high values

citrate-dithionite iron generally occurred in the Bh horizon as compared to the Bt horizon. The amounts of iron and aluminum in Highlands County soils were not sufficient to detrimentally affect phosphorus availability.

generally most abundant in areas where alkaline elements have not been leached by percolation rainwater, such as soils saturated with limestone-influenced ground waters; however, it may occur in moderate amounts regardless of drainage of chemical conditions.

The 14-angstrom intergrade is a mineral of uncertain origin that is widespread in Florida soils. It tends to be most prevalent under moderately acidic, relatively well-drained conditions; although, it occurs in a variety of soil environments. This mineral is the major constituent of sand grain coatings in the Astatula and Tavares soils of Highlands County; however, amounts of coatings that occur in these soils are not sufficient to meet taxonomic criteria established for the recognition of coated Typic Quartzipsamments.

Kaolinite may have been inherited from the parent material, or it may have formed as a weathering product of other minerals. It is relatively stable in the acidic environments of Highlands County soils. Clay-size quartz has primarily resulted from decrements of the silt fraction.

Clay mineralogy can have a significant impact on soil properties, particularly for soils of higher clay content. Soils that contain montmorillonite have a higher capacity for plant nutrient retention than soils dominated by kaolinite, 14-angstrom intergrade minerals, and quartz. Large amounts of montmorillonitic clay can create problems for most types of construction because of the large amounts of swelling when wet and shrinking when dry. In most Highlands County soils, the clay mineralogy influences their use and management less frequently than the total clay content.

### Engineering Index Test Data

Table 20 shows laboratory test data for several pedons sampled at carefully selected sites in the county. The pedons are typical of the series and are

American Association of State Highway and Transportation Officials (AASHTO) (1) or the American Society for Testing and Materials (ASTM) (2).

Table 20 contains engineering test data about some of the major soils in Highlands County. These tests help evaluate the soils for engineering purposes. The classifications given are based on data obtained by mechanical analysis and by tests to determine liquid limits and plastic limits.

The mechanical analyses were made by a combined sieve and hydrometer method (4). In this method, the various grain-size fractions are calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. The mechanical analyses used in this method should not be used in naming textural classes of soils.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of the soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to plastic state. If the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from a semisolid to a plastic state, and the liquid limit is the moisture content at which the soil material changes from a plastic to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic. The data on liquid limit and plasticity index in table 20 are based on laboratory tests of soil samples.

Compaction, or moisture-density, data are important in earthwork. If soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, density



# Classification of the Soils

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The system of soil classification used by the National Cooperative Soil Survey has six categories (11). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

**ORDER.** Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

**SUBORDER.** Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

**GREAT GROUP.** Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Psammaquents (*Psamm*, meaning sand texture, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

**SUBGROUP.** Each great group has a typical subgroup. Other subgroups are intergrades or extragrades. The typical is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective

*Spodic* identifies the subgroup that typifies the great group. An example is Spodic Psammaquents.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is siliceous, hyperthermic Spodic Psammaquents.

**SERIES.** The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

## Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (10). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (11). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

**Anclote Series**

approximately 1,500 feet north and 200 feet east of the southwest corner, sec. 7, T. 38 S., R. 30 E.

The Anclote series consists of very poorly drained

fine sandy loam, 40 to 60 inches deep, with a

Silt plus clay in the 10- to 40-inch control section is less than 5 percent.

The A or Ap horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

The C horizon has hue of 10YR, value of 6 to 8, and chroma of 4 to 8.

## Basinger Series

The Basinger series consists of nearly level, poorly drained and very poorly drained soils that formed in marine sand. These soils are on low flatwoods and in sloughs, depressions, and drainageways in the county. The slopes range from 0 to 2 percent. The soils of the Basinger series are siliceous, hyperthermic Spodic Psammaquents.

Basinger soils are closely associated with Immokalee, Myakka, Placid, Satellite, and Valkaria soils. Immokalee and Myakka soils are in slightly higher positions than Basinger soils and have a spodic horizon. Placid soils have a thicker surface horizon than Basinger soils. Satellite soils do not have a diagnostic horizon and are better drained, and Valkaria soils have higher chromas.

Typical pedon of Basinger fine sand; on the Avon Park Air Force Range; 400 feet north and 1,400 feet west of the southwest corner, sec. 6, T. 33 S., R. 30 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand, rubbed; weak fine granular structure; very friable; common medium and many fine and very fine roots; medium acid; clear smooth boundary.

E1—6 to 16 inches; light gray (10YR 7/1) fine sand; single grained; loose; many fine and few medium roots; slightly acid; gradual wavy boundary.

E2—16 to 21 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; medium acid; gradual wavy boundary.

Bh/E—21 to 52 inches; discontinuous very dark grayish brown (10YR 3/2) spodic material in the upper 4 inches and many small bodies throughout (Bh), brown (10YR 5/2) fine sand (E); single grained; loose; medium acid; gradual wavy boundary.

C1—52 to 62 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; strongly acid; gradual wavy boundary.

C2—62 to 80 inches; grayish brown (10YR 5/2) loamy fine sand; single grained; nonsticky and nonplastic; extremely acid.

The soil reaction ranges from extremely acid to

neutral. The texture below the A horizon is sand or fine sand.

The A or Ap horizon has hue of 10YR, value of 2 to 5, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 to 3.

The Bh part of the Bh/E horizon has hue of 10YR, value of 3 or 4, and chroma of 1 to 3; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 3, and chroma of 2. In many pedons, the Bh horizon is not mixed with the E horizon. The E part has properties similar to those described for the E horizon.

The C horizon has hue of 10YR, value of 5 to 6, and chroma of 1 or 2; or hue of 10YR, value of 4, and chroma of 3. In some pedons, the texture in the lower part of the C horizon is loamy sand or loamy fine sand.

## Bradenton Series

The Bradenton series consists of nearly level, poorly drained soils that formed in loamy marine sediment influenced by calcareous materials. These soils are on hammocks and in open areas on the flatwoods. The slopes range from 0 to 2 percent. The soils of the Bradenton series are coarse-loamy, siliceous, hyperthermic Typic Ochraqualls.

Bradenton soils are closely associated with Felda, Hicoria, Malabar, Myakka, and Pineda soils. Felda soils have an argillic horizon between depths of 20 and 40 inches. Hicoria soils have an umbric epipedon and are in depressions. Malabar and Pineda soils have a Bw horizon. Myakka soils have a spodic horizon.

Typical pedon of Bradenton fine sand; approximately 2,400 feet east and 1,300 feet south of the northwest corner, sec. 1, T. 38 S., R. 31 E.

Ap—0 to 4 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; strongly acid; clear smooth boundary.

E—4 to 14 inches; light gray (10YR 7/1) fine sand; single grained; loose; strongly acid; clear smooth boundary.

Btg—14 to 29 inches; gray (10YR 6/1) very fine sandy loam; common medium prominent yellowish brown (10YR 5/8) mottles; weak fine subangular blocky structure; friable; moderately alkaline; gradual wavy boundary.

Btgc—29 to 44 inches; gray (10YR 6/1) very fine sandy loam; common medium prominent yellowish brown (10YR 5/8) mottles; common or many white calcium carbonate nodules; massive; friable; moderately

alkaline; calcareous; gradual wavy boundary.

Cgk1—44 to 66 inches; light brownish gray (10YR 6/2) loamy sand; few fine distinct brownish yellow (10YR 6/8) mottles; common or many white calcium carbonate nodules; massive; friable; moderately alkaline; calcareous; gradual wavy boundary.

Cgk2—66 to 80 inches; greenish gray (5GY 5/1) very fine sandy loam; common medium prominent brownish yellow (10YR 6/8) mottles; common or many white calcium carbonate nodules; massive; friable; mildly alkaline; calcareous.

The thickness of the solum ranges from 20 to 50 inches. The reaction ranges from strongly acid to neutral in the A and E horizons. The Bt and C horizons range from neutral to strongly alkaline.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 3 to 7, and chroma of 1 or 2. This horizon may have mottles in shades of brown, red, and yellow. The texture is fine sandy loam, sandy loam, or very fine sandy loam. The carbonate content increases as depth increases.

The Ck horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2; or hue of 5GY, value of 6, and chroma of 1 or 2. The texture ranges from sand to sandy clay loam. Some pedons have fine shell fragments.

## Brighton Series

The Brighton series consists of nearly level, very poorly drained soils that formed in decomposing organic material underlain by marine sediment. These soils are mainly in large forested wetland areas within the county. The largest of these areas is on the south side of Lake Istokpoga. The slopes range from 0 to 1 percent. The soils of the Brighton series are dysic, hyperthermic Typic Medihemists.

Brighton soils are closely associated with Basinger, Hontoon, Placid, and Samsula soils. Basinger and Placid soils are mineral soils that normally are adjacent to Brighton soils. Hontoon and Samsula soils are organic soils that contain organic materials that are highly decomposed.

Typical pedon of Brighton muck; in a drained field of caladiums; on Highlands County Road 621, 100 feet west of the northeast corner, sec. 3, T. 37 S., R. 30 E.

Op—0 to 12 inches; black (10YR 2/1) muck; about 4

percent rubbed fiber; weak medium granular structure; loose to friable; dark brown (10YR 4/3) sodium pyrophosphate extract; common fine roots; extremely acid; (pH 3.7 in 0.01 molar calcium chloride solution); gradual wavy boundary.

Oe—12 to 80 inches; dark reddish brown (5YR 3/3) hemic material (peat); about 25 percent rubbed fiber; massive; friable; gray (10YR 5/1) sodium pyrophosphate extract; common medium and fine roots; extremely acid; (pH 3.5 in 0.01 molar calcium chloride solution).

The thickness of the organic material is more than 51 inches. In some areas, it is up to 15 feet thick. The organic material has pH value of less than 4.5 in 0.01 molar calcium chloride solution and has a pH range of 3.5 to 5.5 by the Hellige-Truog method.

The Oa or Op horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; hue of 5YR, value of 2 or 3, and chroma of 1 to 3; or it is neutral (N) and has value of 2. The fiber content is about 20 percent, unrubbed. The rubbed fiber content is about 10 percent or less.

The Oe horizon has hue of 10YR or 5YR, value of 1 to 3, and chroma of 1 to 3. The fiber content is about 40 to 60 percent, unrubbed. The rubbed fiber is about 16 to 40 percent.

## Chobee Series

The Chobee series consists of nearly level, very poorly drained soils that formed in thick beds of loamy marine sediment. These soils are in small to large depressions on the flatwoods and in some swamps and marshes in the county. The slopes range from 0 to 1 percent. The soils of the Chobee series are fine-loamy, siliceous, hyperthermic Typic Argiaquolls.

Chobee soils are closely associated with Basinger, Felda, Hicoria, and Tequesta soils. Basinger soils have a Bh horizon. Felda soils have a Bt horizon between depths of 20 to 40 inches and do not have a mollic epipedon. Hicoria soils have a Bt horizon between depths of 20 to 40 inches. Tequesta soils have an organic surface layer 6 to 16 inches thick.

Typical pedon of Chobee fine sandy loam, depressional; in a marsh on the Avon Park Air Force Range; 2,700 feet south and 1,400 feet west of the northeast corner, sec. 17, T. 33 S., R. 30 E.

A—0 to 18 inches; black (10YR 2/1) fine sandy loam; weak medium granular structure; friable; upper 3 inches stratified muck and fine sandy loam; many or

common fine and very fine roots; strongly acid; gradual wavy boundary.

Btg1—18 to 36 inches; gray (5Y 5/1) sandy clay loam; massive; friable; slightly acid; gradual wavy boundary.

Btg2—36 to 57 inches; dark gray (5Y 4/1) fine sandy loam; many fine prominent yellowish brown (10YR 5/6) mottles; few medium prominent white (10YR 8/1) sand pockets; weak coarse subangular blocky structure; friable; neutral; gradual wavy boundary.

Cg—57 to 80 inches; gray (5Y 5/1) fine sand; common sand pockets; weak fine subangular blocky structure; friable; mildly alkaline.

A thin Oa horizon is on the surface of this soil in many pedons. It has hue of 10YR or 5YR, value of 2, and chroma of 1 or 2.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. The reaction ranges from strongly acid to neutral.

The Btg horizon has hue of 10YR, value of 2 to 6, and chroma of 1. This horizon may have mottles of brown. The reaction of the Btg horizon ranges from

east and 2,100 feet north of the southwest corner, sec. 5, T. 38 S., R. 30 E.

A—0 to 3 inches; very dark gray (10YR 3/1) sand; single grained; loose; many fine and medium and few coarse roots; extremely acid; gradual wavy boundary.

E—3 to 36 inches; white (10YR 8/1) sand; single grained; loose; many fine and medium roots; strongly acid; abrupt wavy boundary.

Bh—36 to 45 inches; black (10YR 2/1) sand; weak fine subangular blocky structure; very friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

BC—45 to 59 inches; brown (10YR 5/3) sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

C—59 to 80 inches; light gray (10YR 7/2) sand; few fine distinct brownish yellow (10YR 6/6) mottles; single grained; loose; few fine roots; very strongly acid.

Depth to the Bh horizon is 30 to 50 inches. The soil reaction ranges from medium acid to extremely acid.

higher positions on the landscape than Duette soils. Daytona and Pomello soils have a spodic horizon between 30 and 50 inches.

Typical pedon of Duette sand, 0 to 5 percent slopes; approximately 1,000 feet east of the southwest corner, sec. 5, T. 38 S., R. 30 E.

- A—0 to 6 inches; dark gray (10YR 4/1) sand; single grained; loose; few coarse and common medium and many fine and very fine roots; extremely acid; clear smooth boundary.
- E1—6 to 18 inches; light gray (10YR 7/1) sand; single grained; loose; common medium and many fine and very fine roots; very strongly acid; gradual wavy boundary.
- E2—18 to 51 inches; white (10YR 8/1) sand; single grained; loose; few medium and fine roots; very strongly acid; abrupt wavy boundary.
- Bh—51 to 59 inches; dark reddish brown (5YR 3/2) sand; weak fine granular structure and about 15 percent weak fine subangular blocky structure; very friable; few medium roots; extremely acid; irregular wavy boundary.
- BC—59 to 80 inches; mixed dark yellowish brown (10YR 3/4) and very pale brown (10YR 7/4) sand; single grained; loose; few medium roots; very strongly acid.

Depth to the Bh horizon is more than 50 inches. The soil reaction ranges from medium acid to extremely acid. The texture is sand or fine sand below the A horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2.

Some pedons have a BE horizon that has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

The Bh horizon has hue of 10YR, value of 2, and chroma of 1; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 1 to 3.

The BC horizon has hue of 10YR or 7.5YR, value of 3 to 7, and chroma of 2 to 4. Some pedons do not have a BC horizon.

Some pedons have a C horizon that has hue of 10YR, value of 5 or 6, and chroma of 2 to 4.

## EauGallie Series

The EauGallie series consists of nearly level, poorly drained soils that formed in marine sediment. These soils are on broad flatwoods that are adjacent to

sloughs and streams. The slopes range from 0 to 2 percent. The soils of the EauGallie series are sandy, siliceous, hyperthermic Alfic Haplaquods.

EauGallie soils are closely associated with Felda, Immokalee, Myakka, Oldsmar, Pomona, and Smyrna soils. Felda soils do not have a spodic horizon. Immokalee, Myakka, and Smyrna soils do not have an argillic horizon. Oldsmar soils have A and E horizons that are more than 30 inches thick. Pomona soils have low base saturation.

Typical pedon of EauGallie fine sand; on the Avon Park Air Force Range; 600 feet north and 2,600 feet west of the southeast corner, sec. 8, T. 33 S., R. 30 E.

- Ap—0 to 4 inches; very dark gray (10YR 3/1) fine sand, rubbed; weak fine granular structure; very friable; common medium and many fine roots; very strongly acid; gradual wavy boundary.
- E1—4 to 16 inches; gray (10YR 5/1) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.
- E2—16 to 26 inches; light gray (10YR 7/1) fine sand; single grained; loose; strongly acid; abrupt wavy boundary.
- Bh1—26 to 33 inches; black (5YR 2/1) fine sand; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
- Bh2—33 to 40 inches; dark reddish brown (5YR 3/2) fine sand; many medium faint reddish brown mottles; weak fine subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
- Btg—40 to 53 inches; light brownish gray (10YR 6/2) sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.
- BCg—53 to 80 inches; light brownish gray (10YR 6/2) fine sandy loam; weak fine subangular blocky structure; friable; very strongly acid.

The soil reaction ranges from very strongly acid to medium acid in the A and E horizons, from very strongly acid to slightly acid in the Bh horizon, and from very strongly acid to mildly alkaline in the Btg and BCg horizons.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sand or fine sand.

The Bh horizon has hue of 5YR or 10YR, value of 2 or 3, and chroma of 1 or 2; or it is neutral (N) and has value of 2. The texture is sand or fine sand.

Some pedons have an E' horizon that has hue of 10YR, value of 4 to 6, and chroma of 1 to 3. The texture is sand or fine sand.

The Btg horizon has hue of 10YR, 5Y, or 2.5Y, value of 5 to 7, and chroma of 1 or 2. The texture is sandy loam, fine sandy loam, or sandy clay loam.

### Felda Series

The Felda series consists of nearly level, poorly drained and very poorly drained soils that formed in

(10YR 6/8) mottles; single grained; loose; few pockets and lenses of calcium carbonate nodules; mildly alkaline.

The thickness of the solum ranges from 30 to 60 inches.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1. The soil reaction ranges from very strongly acid to neutral.

The Eg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. The soil reaction ranges from

sandy and loamy marine sediment. These soils are in large drainageways and depressions and on low flats in the flatwoods part of the county. The slopes range from 0 to 2 percent. The soils of the Felda series are loamy, siliceous, hyperthermic Arenic Ochraqualfs.

Felda soils are closely associated with Bradenton, Malabar, Pineda, Tequesta, and Valkaria soils. Bradenton soils have an argillic horizon within 20 inches of the surface. Malabar, Pineda, and Valkaria soils have a Bw horizon. Tequesta soils have an organic surface layer.

Typical pedon of Felda fine sand; approximately 300 feet east and 200 feet north of the southwest corner, sec. 32, T. 37 S., R. 32 E.

Ap—0 to 7 inches; gray (10YR 5/1) fine sand; single grained; loose; many fine and very fine roots; very strongly acid; clear wavy boundary.

Eg1—7 to 14 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and very fine roots;

very strongly acid to neutral. The texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; hue of 5Y, value of 6, and chroma of 1; or hue of 2.5Y, value of 6, and chroma of 2. This horizon has mottles in shades of brown, yellow, and red. The reaction ranges from slightly acid to mildly alkaline. The texture is sandy loam, very fine sandy loam, fine sandy loam, or sandy clay loam.

The Cg horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; or hue of 5GY, value of 6, and chroma of 1. The reaction is slightly acid to moderately alkaline. The texture is sand, fine sand, or loamy sand. Shell fragments are in some pedons.

### Gator Series

The Gator series consists of nearly level, very poorly drained, organic soils that formed in moderately thick deposits of sanic material underlain by loamy mineral

below 6 inches; medium acid; (pH 5.85 in 0.01 molar calcium chloride solution); gradual wavy boundary.

Cg1—18 to 36 inches; very dark gray (10YR 3/1) sandy clay loam; massive; slightly sticky and plastic;

extremely acid; gradual wavy boundary.

A2—4 to 15 inches; black (N 2/0) sand; weak fine granular structure; very friable; many fine roots; extremely acid; gradual wavy boundary.

Eg—15 to 21 inches; light gray (10YR 7/1) sand; single

Cg2—36 to 55 inches; dark grayish brown (10YR 4/2); stratified sandy loam and loamy sand; massive; nonsticky and nonplastic; neutral; gradual wavy boundary.

Cg3—55 to 80 inches; mixed dark gray and gray (10YR 4/1, 5/1) sand; single grained; nonsticky and nonplastic; neutral.

The thickness of the organic material ranges from 16 to 40 inches. The organic material has pH value of 4.5 or more in 0.01 molar calcium chloride solution and has a pH range of 6.5 to 7.5 by the Hellige-Truog method. The underlying mineral material is slightly acid to moderately alkaline.

The Oa horizon has hue of 10YR, value of 2, and chroma of 2 or less; or hue of 5YR, value of 2, and chroma of 2 or less.

clear smooth boundary.

Btg1—21 to 39 inches; dark gray (N 4/0) fine sandy loam; common medium distinct dark yellowish brown (10YR 5/6) mottles; weak fine subangular blocky structure; friable; streaks and lenses of sandy clay loam; many fine roots; extremely acid; gradual wavy boundary.

Btg2—39 to 52 inches; grayish brown (2.5Y 5/2) fine sandy loam; common medium distinct dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; streaks and lenses of sandy clay loam; many fine roots; extremely acid; gradual wavy boundary.

BCg—52 to 80 inches; dark gray (5Y 4/1) fine sandy loam; weak coarse subangular blocky structure; friable; extremely acid.



county. The slopes range from 0 to 1 percent. The soils of the Hontoon series are dysic, hyperthermic Typic Medisaprists.

Hontoon soils are closely associated with Basinger.

### **Immokalee Series**

The Immokalee series consists of nearly level, poorly drained soils that formed in sandy marine sediment.

Some pedons have a B/C horizon that has hue of 10YR, value of 3 to 5, and chroma of 3 or 4.

Some pedons have a C horizon that has hue of 10YR, value of 4 to 6, and chroma of 1 or 2.

### Kaliga Series

The Kaliga series consists of nearly level, very poorly drained, organic soils that formed in moderately thick deposits of peaty material underlain by loamy mineral

calcium chloride solution and has a pH range of 4.0 to 6.0 by the Hellige-Truog method. The underlying mineral material is neutral to very strongly acid.

The Oa or Op horizon has hue of 10YR, value of 2, and chroma of 1; hue of 7.5YR, value of 3, and chroma of 2; or hue of 5YR, value of 2 or 3, and chroma of 1 to 3.

The Cg horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. The texture is very fine sand, or very fine sand, or fine sand, loam in the upper part

layers. These soils are in depressional areas and in

very fine sand to heavy sand, silty, loam, sand, silt, or

(7.5YR 4/6) iron concretions; single grained; loose; medium acid; clear wavy boundary.

Bw4—44 to 48 inches; yellowish brown (10YR 5/6) fine sand; single grained; loose; strongly acid; gradual wavy boundary.

Btg—48 to 80 inches; greenish gray (5GY 5/1) fine sandy loam; common medium prominent light olive brown (2.5Y 5/6) mottles and few fine faint yellowish brown mottles; moderate medium subangular blocky structure; friable; strongly acid.

The thickness of the solum ranges from 50 to 80 inches. The soil reaction ranges from strongly acid to moderately alkaline.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sand or fine sand.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8; or hue of 7.5YR, value of 5, and chroma of 6 to 8. The texture is sand or fine sand.

Some pedons have an E' horizon that has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 4 to 7, and chroma of 1; or hue of 5Y, value of 5 or 6, and chroma of 1. This horizon has mottles in shades of red, yellow, and brown. The texture is sandy loam, fine sandy loam, or sandy clay loam. In many pedons, this horizon has lenses and pockets of a coarser material.

Some pedons have a C horizon that has hue of 10YR, value of 5 or 6, and chroma of 1 or 2; or hue of 5Y, value of 5 or 6, and chroma of 1. The texture is sand or fine sand, and this horizon can have pockets or lenses of a loamy material.

## Myakka Series

The Myakka series consists of nearly level, poorly drained soils that formed in deposits of thick marine sediment. These soils are in the low, broad, flatwood areas in the county. The slopes range from 0 to 2 percent. The soils of the Myakka series are sandy, siliceous, hyperthermic Aeric Haplaquods.

Myakka soils are closely associated with Basinger, Immokalee, Satellite, Smyrna, and Valkaria soils. Basinger soils are in slightly lower positions on the landscape than Myakka soils and do not have a spodic horizon. Immokalee soils have a spodic horizon between depths of 30 to 50 inches. Satellite soils do not have a diagnostic horizon and are better drained than Myakka soils. Smyrna soils have a spodic horizon less

than 20 inches from the surface. Valkaria soils do not have a spodic horizon and have higher chromas than Myakka soils.

Typical pedon of Myakka fine sand; near Harney Pond Canal; approximately 2,100 feet south and 100 feet east of the northwest corner, sec. 10, T. 30 S., R. 31 E.

Ap—0 to 4 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; many very fine and fine roots; very strongly acid; clear smooth boundary.

E—4 to 24 inches; light gray (10YR 7/1) and light brownish gray (10YR 6/2) sand; single grained; loose; very strongly acid; abrupt smooth boundary.

Bh1—24 to 43 inches; black (5YR 2/1) sand; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Bh2—43 to 58 inches; dark brown (7.5YR 3/2) sand; common medium faint black (5YR 2/1) mottles; massive; loose; very strongly acid; gradual wavy boundary.

BC—58 to 80 inches; dark brown (10YR 3/3) sand; single grained; loose; very strongly acid.

The soil reaction ranges from slightly acid to very strongly acid. The texture below the A horizon is sand or fine sand.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3.

The BC horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

Some horizons have a C horizon that has hue of 10YR, value of 4 to 7, and chroma of 1 to 4.

## Oldsmar Series

The Oldsmar series consists of nearly level, poorly drained soils that formed in marine sediment. These soils are mainly in broad, flatwood areas that are adjacent to sloughs and streams. The slopes range from 0 to 2 percent. The soils of the Oldsmar series are sandy, siliceous, hyperthermic Alfic Arenic Haplaquods.

Oldsmar soils are closely associated with EauGallie, Felda, Immokalee, Myakka, and Smyrna soils. EauGallie soils are on the same landscape as Oldsmar soils but have a spodic horizon within 30 inches of the surface. Felda soils have an argillic horizon between

depths of 20 to 40 inches. Immokalee, Myakka, and Smyrna soils have a spodic horizon but do not have an argillic horizon.

Typical pedon of Oldsmar fine sand; near Graham Dairy Road; approximately 1,800 feet south and 2,400 feet west of the northeast corner, sec. 11, T. 39 S., R. 28 E.

- Ap—0 to 4 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; neutral; gradual wavy boundary.
- E1—4 to 12 inches; gray (10YR 6/1) fine sand; single grained; loose; slightly acid; gradual wavy boundary.
- E2—12 to 32 inches; light gray (10YR 7/2) fine sand; single grained; loose; slightly acid; clear wavy boundary.
- Bh1—32 to 35 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; medium acid; gradual wavy boundary.
- Bh2—35 to 45 inches; dark brown (10YR 3/2) fine sand; weak fine granular structure; very friable; strongly acid; gradual wavy boundary.
- Bh3—45 to 54 inches; brown (7.5YR 4/2) fine sand; weak fine granular structure; loose; slightly acid; clear wavy boundary.
- Btg—54 to 60 inches; grayish brown (2.5Y 5/2) sandy clay loam; weak medium subangular blocky structure; friable; neutral; gradual wavy boundary.
- C—60 to 80 inches; yellowish brown (10YR 5/4) fine sand; single grained; loose; neutral.

The soil reaction ranges from neutral to extremely acid in the A and Bh horizons. It ranges from slightly acid to moderately alkaline in the Bt and C horizons. The texture of the A, E, Bh, and C horizons is sand or fine sand. The texture of the Bt horizon is sandy loam, fine sandy loam, or sandy clay loam.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2.

The Bh horizon has hue of 10YR or 5YR, value of 2 or 3, and chroma of 1 to 3; or hue of 7.5YR, value of 3 or 4, and chroma of 2.

The Bt horizon has hue of 2.5Y, value of 4 to 7, and chroma of 1 to 4; hue of 10YR, value of 4 to 6, and chroma of 1 to 3; or hue of 5GY, value of 5 or 6, and chroma of 1.

The C horizon has hue of 10YR, value of 5 to 7, and chroma of 2 to 4; or hue of 5Y, value of 5, and chroma of 1. Some pedons do not have a C horizon.

## Orsino Series

The Orsino series consists of nearly level to gently sloping, moderately well drained, droughty soils that formed in marine and eolian deposits. These soils are on moderately high ridges in the ridge part of the county. The slopes range from 0 to 5 percent. The soils of the Orsino series are hyperthermic, uncoated Spodic Quartzipsamments.

Orsino soils are closely associated with Archbold, Astatula, Duette, Paola, Pomello, St. Lucie, and Tavares soils. Archbold and St. Lucie soils do not have a diagnostic horizon within 80 inches of the surface. Astatula and Paola soils are excessively drained and are in slightly higher positions on the landscape than Orsino soils. Duette and Pomello soils have a spodic horizon. Tavares soils do not have an E horizon.

Typical pedon of Orsino sand, 0 to 5 percent slopes; on the Archbold Biological Station; approximately 2,000 feet west and 2,600 feet north of the southeast corner, sec. 5, T. 38 S., R. 30 E.

- A—0 to 2 inches; gray (10YR 5/1) sand; single grained; loose; many fine and medium roots; very strongly acid; gradual wavy boundary.
- E—2 to 46 inches; white (10YR 8/1) sand; single grained; loose; many fine and medium roots; strongly acid; abrupt irregular boundary.
- Bw/Bh—46 to 66 inches; yellowish brown (10YR 5/4) sand (Bw), discontinuous lenses of reddish brown (5YR 4/3) sand (Bh), and dark reddish brown (5YR 3/4) sand (Bh); weak fine subangular blocky structure and weak fine granular structure; very friable; few fine and medium roots; very strongly acid; abrupt irregular boundary.
- C2—66 to 80 inches; very pale brown (10YR 7/4) sand; single grained; loose; few fine and medium roots; strongly acid.

The soil reaction ranges from medium acid to extremely acid. Below the surface, the texture ranges from sand to fine sand to a depth of 80 inches or more. Silt plus clay in the 10- to 40-inch control section is less than 5 percent.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1.

The E horizon has hue of 10YR, value of 7 or 8, and chroma of 1 or 2.

The Bw part of the Bw&Bh horizon has hue of 10YR, value of 5 or 6, and chroma of 4 to 8. The Bh part has hue of 10YR, value of 3, and chroma of 2; hue of 5YR, value of 4, and chroma of 3; or hue of 5YR, value of 3,

and chroma of 2 to 4. Tongues of the E horizon extend into and throughout the B horizon.

The C horizon has hue of 10YR, value of 6 or 7, and chroma of 3 or 4; or hue of 10YR, value of 8, and chroma of 1 to 3. In some pedons, the C horizon has mottles in shades of red and yellow. Some pedons have many uncoated sand grains and small pockets and lenses of white sand.

### Paola Series

The Paola series consists of nearly level to moderately sloping, excessively drained, droughty soils that formed in marine or eolian deposits. These soils are on high sandy ridges in the ridge part of the county. The slopes range from 0 to 12 percent. The soils of the Paola series are hyperthermic, uncoated Spodic Quartzipsamments.

Paola soils are closely associated with Astatula, Duette, Orsino, Pomello, St. Lucie, and Tavares soils. Astatula and Tavares soils do not have an albic horizon. Duette and Pomello soils have a spodic horizon. Orsino soils have a water table between 40 inches and 80 inches. St. Lucie soils do not have a diagnostic horizon within 80 inches of the surface.

Typical pedon of Paola sand, 0 to 8 percent slopes; on the Archbold Biological Station; 1,700 feet west and 1,500 feet south of the northeast corner, sec. 8, R. 30 E., T. 38 S.

Ap—0 to 5 inches; gray (10YR 5/1) sand; single grained; loose; many fine and medium roots; strongly acid; clear smooth boundary.

E—5 to 17 inches; light gray (10YR 7/1) sand; single

The E horizon has hue of 10YR, value of 7 or 8, and chroma of 1.

The Bw horizon has hue of 10YR, value of 5 to 7, and chroma of 4 to 8. Some pedons have tongues of E horizon material extending into the Bw horizon. Where tongues are prominent, Bh bodies are common between the E and Bw horizons.

The C horizon has hue of 10YR, value of 6 or 7, and chroma of 3 or 4.

### Pineda Series

The Pineda series consists of nearly level, poorly drained soils that formed in sandy and loamy marine sediment. These soils are on broad, low flats, in sloughs and large, poorly defined drainageways in the flatwoods part of the county. The slopes range from 0 to 2 percent. The soils of the Pineda series are loamy, siliceous, hyperthermic Arenic Glossaqualfs.

Pineda soils are closely associated with Basinger, Felda, Malabar, Myakka, Smyrna, and Valkaria soils. Basinger, Myakka, Smyrna, and Valkaria soils do not have an argillic horizon. Felda soils do not have a Bw horizon, and Malabar soils have an argillic horizon at a depth or more than 40 inches.

Typical pedon of Pineda sand; 2,000 feet east and 1,700 feet south of the northwest corner, sec. 33, T. 38 S., R. 31 E.

A—0 to 4 inches; dark gray (10YR 4/1) sand; weak fine granular structure; very friable; many fine and few medium roots; strongly acid; clear smooth boundary.

E—4 to 12 inches; light gray (10YR 7/1) sand; single

grained; loose; neutral; gradual wavy boundary.  
Cg2—63 to 80 inches; light greenish gray (5GY 7/1)  
sand; single grained; loose; moderately alkaline.

The thickness of the solum is 40 to 80 inches. The  
soil reaction ranges from strongly acid to neutral in the  
A, E, and Bw horizons, from strongly acid to moderately  
alkaline in the Bt horizon, and from medium acid to  
moderately alkaline in the C horizon.

The A horizon has hue of 10YR, value of 2 or 3, and

A2—3 to 11 inches; very dark gray (10YR 3/1) fine  
sand; weak fine granular structure; very friable; few  
fine and medium roots; very strongly acid; gradual  
wavy boundary.

Cg1—11 to 38 inches; light brownish gray (10YR 6/2)  
fine sand; few medium distinct very dark gray  
(10YR 3/1) mottles; single grained; loose; slightly  
acid; gradual wavy boundary.

Cg2—38 to 49 inches; dark grayish brown (10YR 4/2)  
fine sand; single grained; loose; nonsticky and

within 80 inches of the surface and are somewhat poorly drained.

Typical pedon of Pomello sand, 0 to 5 percent slopes; on the Avon Park Air Force Range; 250 feet north and 2,900 feet east of the southwest corner, sec. 6, T. 34 S., R. 31 E.

A—0 to 4 inches; dark gray (10YR 4/1) sand, rubbed; single grained; loose; many fine and common medium roots; strongly acid; clear smooth boundary.

E—4 to 56 inches; white (10YR 8/1) sand; single grained; loose; many medium and common fine roots in upper 10 inches; few medium distinct dark grayish brown and black (10YR 4/2, 2/1) mottles that occur as staining along old root channels; strongly acid; abrupt wavy boundary.

Bh—56 to 62 inches; mixed dark brown (7.5YR 3/2) and dark reddish brown (5YR 3/2) sand; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

BC—62 to 80 inches; brown (10YR 4/3) sand; single grained; loose; common medium distinct dark brown (7.5YR 3/2) mottles; medium acid.

The soil reaction ranges from very strongly acid to medium acid. The texture is sand or fine sand below the A horizon.

The A horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 or 2. Streaks and staining of hue of 10YR, value of 2 to 4, and chroma of 1 or 2 are along old root channels.

The Bh horizon has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 to 3.

The BC horizon has hue of 10YR, value of 3 or 4, and chroma of 3. Some pedons do not have a BC horizon.

Some pedons have a C horizon that has hue of 10YR, value of 5 to 7, and chroma of 1.

## Pomona Series

The Pomona series consists of nearly level, poorly drained soils that formed in marine sediment. These soils are on the flatwoods that are adjacent to seep

series are sandy, siliceous, hyperthermic Ultic Haplaquods.

Pomona soils are closely associated with Basinger, EauGallie, Myakka, Placid, Smyrna, and Valkaria soils. Basinger, Myakka, Placid, Smyrna, and Valkaria soils do not have an argillic horizon. EauGallie soils have high base saturation.

Typical pedon of Pomona sand; 2,100 feet north of the southwest corner, sec. 6, T. 34 S., R. 28 E.

A—0 to 6 inches; black (10YR 2/1) sand; weak fine granular structure; very friable; common fine and very fine roots; very strongly acid; clear smooth boundary.

E1—6 to 14 inches; gray (10YR 5/1) sand; single grained; nonsticky and nonplastic; common fine and few medium roots; very strongly acid; clear wavy boundary.

E2—14 to 29 inches; light gray (10YR 7/1) sand; single grained; nonsticky and nonplastic; very strongly acid; abrupt smooth boundary.

Bh1—29 to 37 inches; dark brown (7.5YR 3/2) sand; massive; nonsticky and nonplastic; very strongly acid; gradual wavy boundary.

Bh2—37 to 51 inches; very dark grayish brown (10YR 3/2) sand; massive; nonsticky and nonplastic; very strongly acid; gradual wavy boundary.

E'—51 to 61 inches; light brownish gray (10YR 6/2) sand; single grained; nonsticky and nonplastic; strongly acid; gradual wavy boundary.

Btg—61 to 80 inches; gray (5Y 6/1 and 5Y 5/1) sandy loam; weak medium subangular blocky structure; nonsticky and nonplastic; strongly acid.

The thickness of the solum is 60 or more inches. The soil reaction ranges from extremely acid to strongly acid except where lime has been added to the soil.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sand or fine sand.

The Bh horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2. The texture is sand or fine sand.

The E' horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. The texture is sand or fine sand. Some pedons do not have an E' horizon.

yellow. The texture is sandy loam or sandy clay loam.

### St. Johns Series

The St. Johns series consists of nearly level to gently sloping, poorly drained soils that formed in thick, sandy marine deposits. These soils are on seepy side slopes between ridgetops and the flatwoods. The slopes range from 0 to 5 percent. The soils of the St. Johns series

and B'h horizons and are underlain by a C horizon.

Some pedons have a C horizon that has hue of 10YR, value of 4 to 7, and chroma of 1 to 3.

### St. Lucie Series

The St. Lucie series consists of nearly level to moderately sloping, excessively drained, droughty soils that formed in marine and eolian deposits. These soils

St. Johns soils are closely associated with Basinger and Placid soils. Basinger and Placid soils do not have a spodic horizon.

Typical pedon of St. Johns sand, in an area of Basinger, St. Johns, and Placid soils; 1,700 feet north

county. The slopes range from 0 to 8 percent. The soils of the St. Lucie series are hyperthermic, uncoated Typic Quartzipsamments.

St. Lucie soils are closely associated with Archbold, Astatula, Duette, Orsino, Paola, Pomello, and Tavares soils. Archbold soils have a water table at a depth of 40



Samsula soils are closely associated with Basinger, Hontoon, Placid, Sanibel, and Valkaria soils. Basinger, Placid, Sanibel, and Valkaria soils are mineral soils. In addition, Hontoon soils have organic material more than 51 inches thick.

Typical pedon of Samsula muck; in a drained depressional area; 2,100 feet west and 1,000 feet south of the northeast corner, sec. 3, T. 38 S., R. 31 E.

Oa1—0 to 12 inches; black (5YR 2/1) muck; about 4 percent rubbed fiber; moderate medium subangular blocky structure; friable; dark brown (10YR 4/3) sodium pyrophosphate extract; common fine roots; extremely acid; (pH 3.7 in 0.01 molar calcium chloride solution); gradual wavy boundary.

Oa2—12 to 36 inches; black (10YR 2/1) muck; about 1 percent rubbed fiber; moderate medium subangular blocky structure; friable; dark brown (10YR 4/3)

sandy soils that have a layer of well decomposed organic material over the surface of the mineral soil. These soils are in transitional positions between mineral and organic soils. They are in marshes, swamps, and poorly defined drainageways up to several hundred acres in size. The slopes range from 0 to 2 percent. The soils of the Sanibel series are sandy, siliceous, hyperthermic Histic Humaquepts.

Sanibel soils are closely associated with Basinger, Kaliga, Placid, Samsula, and Tequesta soils. Basinger and Placid soils do not have a layer of organic material on the surface of the mineral soils. Samsula and Kaliga soils have an organic surface more than 16 inches thick. Tequesta soils have an argillic horizon.

Typical pedon of Sanibel muck; near the intersection of Henscratch and Clark Roads; approximately 1,000 east of the northwest corner, sec. 31, T. 36 S., R. 29 E.

Oa 0 to 12 inches; black (10YR 2/1) muck; about 1

extremely acid; (pH 3.7 in 0.01 molar calcium chloride solution); abrupt wavy boundary.

granular structure; very friable; very strongly acid; gradual wavy boundary.

hyperthermic, uncoated Aquic Quartzipsamments.

Satellite soils are closely associated with Archbold, Basinger, Daytona, Duette, Immokalee, Myakka, Pomello, and St. Lucie soils. Archbold soils are better drained than Satellite soils. Basinger soils have a layer that is more than 1 unit of value darker than the overlying horizon within 10 to 40 inches of the surface, and they are poorly drained. Daytona, Duette, Immokalee, Myakka, and Pomello soils have a spodic horizon. St. Lucie soils do not have a water table within 80 inches of the surface.

Typical pedon of Satellite sand; on the Avon Park Air Force Range; approximately 2,800 feet north and 200 feet west of the southeast corner, sec. 7, T. 33 S., R. 31 E.

A—0 to 4 inches; dark gray (10YR 4/1) sand, rubbed; single grained; loose; very strongly acid; clear smooth boundary.

C1—4 to 26 inches; white (10YR 8/1) fine sand; few coarse distinct brown (10YR 5/3 and 5/4) mottles along old root channels; single grained; loose; strongly acid; gradual wavy boundary.

C2—26 to 80 inches; white (10YR 8/1) fine sand; single grained; loose; slightly acid.

The soil reaction ranges from very strongly acid to mildly alkaline. The texture is sand or fine sand to a depth of 80 inches or more. Silt and clay is less than 2 percent in the control section

soils do not have a spodic horizon and have higher chroma than Smyrna soils.

Typical pedon of Smyrna sand; 1,500 feet east and 2,500 feet south of the northwest corner, sec. 14, T. 38 S., R. 31 E.

Ap—0 to 5 inches; dark gray (10YR 4/1) sand; single grained; loose; many very fine and common medium roots; medium acid; abrupt irregular boundary.

E—5 to 15 inches; light gray (10YR 6/1) fine sand; single grained; loose; very strongly acid; abrupt irregular boundary.

Bh1—15 to 18 inches; black (N 2/0) fine sand; weak fine subangular blocky structure; friable; extremely acid; clear irregular boundary.

Bh2—18 to 22 inches; dark brown (7.5YR 3/2) fine sand; few medium black (N 2/0) spodic bodies; single grained; loose; extremely acid; clear wavy boundary.

BC—22 to 35 inches; brown (10YR 5/3) fine sand; few medium distinct very dark grayish brown (10YR 3/2) mottles and few fine distinct brown (7.5YR 4/4) mottles; few to common iron cemented sandstone nodules; single grained; loose; very strongly acid; gradual wavy boundary.

C1—35 to 45 inches; light yellowish brown (10YR 6/4) fine sand; many coarse distinct strong brown (7.5YR 5/6) mottles and dark brown (7.5YR 4/4) mottles; few to common iron cemented sandstone

chroma of 2. The BC horizon has hue of 10YR, value of 3 to 5, and chroma of 3.

Some pedons have an E' horizon and a B'h horizon at a depth of more than 40 inches. These horizons have the same color range as the E and Bh horizons.

The C horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 4.

### Tavares Series

The Tavares series consists of nearly level to rolling, moderately well drained, droughty soils that formed in marine and eolian deposits. These soils are on moderately high ridges in the ridge part of the county. The slopes range from 0 to 12 percent. The soils of the Tavares series are hyperthermic, uncoated, Typic Quartzipsamments.

Tavares soils are closely associated with Astatula, Orsino, Paola, St. Lucie, and Satellite soils. Astatula, Paola, and St. Lucie soils are excessively drained. Orsino soils have an E horizon. Satellite soils are somewhat poorly drained.

Typical pedon of Tavares sand, 0 to 5 percent slopes; approximately 200 feet north and 500 feet east of the southwest corner, sec. 6, T. 34 S., R. 30 E.

The C3 and C4 horizons have hue of 10YR, value of 6 to 8, and chroma of 1 to 4. In some pedons, the C3 and C4 horizons have mottles in shades of brown and yellow.

### Tequesta Series

The Tequesta series consists of nearly level, very poorly drained soils that formed in sandy and loamy marine sediment. These soils formed in conditions favorable for the accumulation of organic material. They are in marshes and depressions in the county and are generally about 5 to 300 acres in size. The slopes range from 0 to 2 percent. The soils of the Tequesta series are loamy, siliceous, hyperthermic Arenic Glossaqualfs.

Tequesta soils are closely associated with Basinger, Chobee, Hicoria, and Kaliga soils. Basinger, Chobee, and Hicoria soils do not have an organic surface layer. Kaliga soils have an organic surface more than 16 inches thick.

Typical pedon of Tequesta muck; in a drained area; 400 feet north and 1,800 feet east of the southwest corner, sec. 27, T. 37 S., R. 31 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) sand; single grained; loose; many fine and medium roots; strongly acid; clear wavy boundary.

C1—6 to 36 inches; yellow (10YR 5/6) sand; single grained; loose; few fine and medium roots; strongly acid; gradual wavy boundary.

C2—36 to 46 inches; very pale brown (10YR 7/4) sand; small pockets and lenses of white (10YR 8/1) sand; single grained; loose; strongly acid; gradual wavy boundary.

C3—46 to 56 inches; yellow (10YR 7/3) sand; many medium prominent reddish yellow (7.5YR 6/8) mottles; streaks and lenses of white (10YR 8/1) sand; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.

C4—56 to 80 inches; white (10YR 8/1) sand; single grained; loose; few fine roots; strongly acid.

The soil reaction ranges from medium acid to extremely acid. The texture below the surface ranges from sand to fine sand. Silt plus clay is the 10 to 40

Oa—0 to 12 inches; black (10YR 2/1) muck; less than 5 percent rubbed fiber; weak fine granular structure; friable; strongly acid; clear smooth boundary.

A—12 to 17 inches; black (10YR 2/1) fine sand; single grained; loose; about 10 percent organic matter; strongly acid; gradual wavy boundary.

Eg—17 to 32 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; slightly acid; gradual wavy boundary.

Btg—32 to 77 inches; dark gray (10Y 4/1) fine sandy loam; common medium prominent brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; friable; slightly acid; gradual wavy boundary.

Cg—77 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; few lenses of loamy sand; neutral.

The soil reaction ranges from strongly acid to neutral in the Oa and A horizons and from slightly acid to moderately alkaline in the Btg and 2Cg horizons.

The Oa horizon has hue of 10YR, 5YR, or 10Y, value of 1 to 3, and chroma of 1 to 3.

and chroma of 1 or 2. The texture is sand or fine sand.

The Btg horizon has hue of 10YR, value of 4 or 5, and chroma of 1 or 2. In some pedons, this horizon has mottles in shades of brown, yellow, and gray. The texture is sandy loam, fine sandy loam, or sandy clay loam.

The 2Cg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2. The texture is sand, fine sand, or loamy sand.

## Valkaria Series

The Valkaria series consists of nearly level, poorly drained soils that formed in marine sand. These soils are on the low flatwoods and in sloughs and poorly defined drainageways in the county. The slopes range from 0 to 2 percent. The soils of the Valkaria series are siliceous, hyperthermic Spodic Psammaquents.

Valkaria soils are closely associated with Basinger, Immokalee, Malabar, Myakka, Pineda, Placid, and Smyrna soils. Basinger soils do not have chromas as high as Valkaria soils. Immokalee, Myakka, and Smyrna soils are in slightly higher positions on the landscape than Valkaria soils and have a dark spodic horizon. Malabar and Pineda soils have a Bt horizon. Placid

soils have a thick dark surface horizon.

strongly acid; clear smooth boundary.

E1—5 to 11 inches; light gray (10YR 7/1) fine sand; single grained; loose; few fine and very fine roots; strongly acid; gradual wavy boundary.

E2—11 to 16 inches; light gray (10YR 7/2) fine sand; common medium prominent brownish yellow (10YR 6/8) mottles; single grained; loose; medium acid; gradual wavy boundary.

Bw1—16 to 33 inches; yellowish brown (10YR 5/8) fine sand; single grained; loose; medium acid; gradual wavy boundary.

Bw2—33 to 51 inches; light yellowish brown (10YR 6/4) fine sand; common medium faint brownish yellow (10YR 6/8) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C—51 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; extremely acid.

The soil reaction ranges from very strongly acid to neutral in the A, E, and Bw horizons. It ranges from very strongly acid to moderately alkaline in the C horizon. Texture below the A horizon is fine sand or sand to a depth of 80 inches.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1.

The E horizon has hue of 10YR, value of 6 or 7, and

# Formation of the Soils

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In this section, the factors and processes of soil formation are discussed and related to the soils in the survey area.

## Factors of Soil Formation

Soil is produced by forces of weathering acting on the parent material that has been deposited or accumulated by geologic agencies. The kind of soil that develops depends on five major factors. These factors are the type of parent material; the climate under which soil material has existed since accumulation; the plant and animal life in and on the soil; the relief, or lay of the land; and the length of time the forces of soil formation have acted on the soil material.

The five soil-forming factors are interdependent; each modifies the effect of the others. Any one of the five factors can have more influence than the others on the formation of a soil and can account for most of its properties. For example, if the parent material is quartz sand, the soil generally has weakly expressed horizons. In some places, the effect of the parent material is

the ridge part of the county has soils formed in eolian sands. These eolian sandy soils formed atop the Cypress Head Formation and the Hawthorn Group.

## Climate

The climate of Highlands County is generally warm and humid. Temperature extremes are modified somewhat by the many lakes in the county. The average rainfall is about 55 inches per year. In summer, the climate is uniform throughout the county.

Few differences among the soils are caused by the climate; however, the climate aids in rapid decomposition of organic matter, and it hastens chemical reaction in the soil. The heavy rainfall leaches the soils of most plant nutrients and produces a strongly acid condition in many of the sandy soils. Rain also carries the less soluble fine particles downward.

Because of these climatic conditions, many soils have low organic content, low natural fertility, and low available water capacity.

## Plants and Animals

Man has influenced the formation of soils by clearing the forests, cultivating the soils, draining wet areas, and introducing different kinds of plants. The complex of living organisms that affect soil formation has been drastically changed because of man's activities; nevertheless, these activities have had little effect on the soils except for loss of organic matter.

### **Relief**

Relief has affected the formation of the soils in Highlands County mainly through its influence on soil-water relationships and through its effect on erosion in the central ridge part of the county. Other factors of soil formation generally associated with relief, such as temperature and plant cover, are of minor importance.

In the three general areas in the county—flatwoods, swamps, and central ridge—some differences in the soils are directly related to relief.

The soils on the flatwoods have a high water table, and periodically the surface is wet. The soils in the swamps are covered by water for long periods, and in many places, the content of organic matter in the surface layer is high. The soils on the central ridge are at higher elevations than those on the flatwoods and in the swamps. Most of the deep, sandy soils on the central ridge are better drained than the soils on the flatwoods and in the swamps and are not influenced by a ground water table.

### **Time**

Time is an important factor in soil formation. The physical and chemical changes brought about by climate, living organisms, and relief are slow. The

length of time needed to convert raw geological material into soil varies according to the nature of the geological material and the interaction of the other factors. Some basic minerals from which soils are formed weather fairly rapidly; other minerals are chemically inert and show little change over long periods. The translocation of fine particles within the soil to form horizons varies under differing conditions, but the processes always take a relatively long time.

### **Processes of Soil Formation**

The soil genesis refers to the formation of soil horizons. The differentiation of horizons in soils in Highlands County is the result of accumulation of organic matter, leaching of carbonates, reduction and transfer of iron, or accumulation of silicate clay minerals. Sometimes more than one of these processes is involved.

Some organic matter has accumulated in the upper layers of most of the soils. The content of organic matter is low in some of the soils and fairly high in others.

Carbonates and salts have been leached in all of the soils. Because the leaching permitted the subsequent translocation of silicate clay materials in some soils, the effects have been indirect. The soils in Highlands County are leached to varying degrees.

The reduction and transfer of iron has occurred in most of the soils in the county except the organic soils. In some of the wet soils, iron in the subsoil forms yellowish brown horizons and some concretions. The Pineda soil, for example, has a yellowish brown layer with common segregated iron concretions.

## References

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| <p>(1) American Association of State Highway and Transportation Officials. 1982. Standard specifications for highway materials and methods of sampling and testing. Ed. 13, 2 vol., illus.</p> | <p>(9) United States Department of Agriculture. 1929 (Rev. 1976). Volume, yield, and stand tables for second growth southern pines. Forest Serv., Misc. Publ. 50, 302 pp., illus.</p> |
| <p>(2) American Society for Testing and Materials. 1986. Standard test method for classification of soils for engineering purposes. ASTM Stand. D 2487</p>                                     | <p>(10) United States Department of Agriculture. 1951 (Being revised). Soil survey manual. U.S. Dep. Agric. Handb. 18, 503 pp., illus./Supplements</p>                                |





# Glossary

**ABC soil.** A soil having an A, a B, and a C horizon.

**AC soil.** A soil having only an A and a C horizon.

Commonly such soil formed in recent alluvium or on steep rocky slopes.

**Alluvium.** Material, such as sand, silt, or clay, deposited on land by streams.

**Area reclaim** (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**Available water capacity (available moisture capacity).** The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as

potassium, magnesium, sodium, and hydrogen.

**Cation-exchange capacity.** The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

**Clay.** As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

**Clay film.** A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e., clay coating, clay skin.

**Climax vegetation.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change substantially.

Very low ..... 0 to 3  
Low ..... 3 to 6

remains the same.

**Coarse fragments.** If round, mineral or rock particles 2

**Consistence, soil.** The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

*Loose.*—Noncoherent when dry or moist; does not hold together in a mass.

*Friable.*—When moist, crushes easily under gentle pressure between thumb and forefinger and can

be crushed to rather fine lumps. artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

*Excessively drained.*—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

**Drainage, surface.** Runoff, or surface flow of water, from an area.

**Eluviation.** The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*Erosion* (geologic)—Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

*Erosion* (accelerated)—Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

**Excess fines** (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

**Excess humus.** Too much organic matter for intended use.

**Fast intake** (in tables). The movement of water into the soil is rapid.

**Fertility, soil.** The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

**Field moisture capacity.** The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after

**Flood plain.** A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

**Forb.** Any herbaceous plant that is not a grass or a sedge.

**Genesis, soil.** The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

**Gleyed soil.** Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

**Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

**Ground water** (geology). Water filling all the unblocked pores of underlying material below the water table.

**Hardpan.** A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

**Hemic soil material (mucky peat).** Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

**Horizon, soil.** A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:  
*O horizon.*—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.

*A horizon.*—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

*E horizon.*—The mineral horizon in which the main

clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

**C horizon.**—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is

**Infiltration.** The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

**Intake rate.** The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time.

Therefore, intake rate for design purposes is not a

numeral 2 precedes the letter C.

**R layer.**—Consolidated rock (unweathered bedrock) beneath the soil. The rock commonly underlies a C horizon, but can be directly below an A or a B horizon.

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils

irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2 .....	very low
0.2 to 0.4 .....	low
0.4 to 0.75 .....	moderately low
0.75 to 1.25 .....	moderate
1.25 to 1.75 .....	moderately high

**Low strength.** The soil is not strong enough to support loads.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**Mineral soil.** Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

**Miscellaneous area.** An area that has little or no natural soil and supports little or no vegetation.

**Morphology, soil.** The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

**Mottling, soil.** Irregular spots of different colors that vary in number and size. Mottling generally

**Parent material.** The unconsolidated organic and mineral material in which soil forms.

**Peat.** Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

**Pedon.** The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

**Percolation.** The downward movement of water through the soil.

**Percs slowly** (in tables). The slow movement of water through the soil adversely affects the specified use.

indicates poor aeration and impeded drainage.

to move through the profile. Permeability is

depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

**Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

**Poor filter** (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

**Poor outlets** (in tables). In these areas, surface or

Mildly alkaline..... 7.4 to 7.8  
 Moderately alkaline..... 7.9 to 8.4  
 Strongly alkaline ..... 8.5 to 9.0  
 Very strongly alkaline ..... 9.1 and higher

**Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

**Relief.** The elevations or inequalities of a land surface, considered collectively.

**Rock fragments.** Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rooting depth** (in tables). There is a shallow root zone.

**Site index.** A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

**Slope** (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

**Slough.** Narrow to broad, generally grassy, poorly defined drainageway that is subject to sheet flow during the rainy season.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Soil.** A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

**Soil separates.** Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand .....	2.0 to 1.0
Coarse sand .....	1.0 to 0.5
Medium sand .....	0.5 to 0.25
Fine sand .....	0.25 to 0.10
Very fine sand .....	0.10 to 0.075

*grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below plow depth.

**Substratum.** The part of the soil below the solum.

**Subsurface layer.** Technically, the A2 horizon.

Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

**Surface layer.** The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters).

Frequently designated as the "plow layer," or the "Ap horizon."

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

**Terrace.** An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

**Texture, soil.** The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand*, *loamy sand*, *sandy loam*, *loam*, *silt loam*, *silt*, *sandy clay loam*, *clay loam*, *silty clay loam*, *sandy clay*, *silty clay*, and *clay*. The sand, loamy sand, and sandy loam classes may be

**Well graded.** Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and

bearing properties by compaction. This contrasts with poorly graded soil.

**Wetness.** Soil is wet during some periods of use.



# Tables

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TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1932 through 1984 at Archbold Biological Station in  
Highlands County, Florida]

Month	Rainfall			Temperature				
	Mean total	Minimum total	Maximum total	Mean daily	Mean daily maximum	Mean daily minimum	Highest recorded	Lowest recorded
	<u>In</u>	<u>In</u>	<u>In</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>	<u>°F</u>
January-----	1.87	0.00	7.9	61.4	75.0	47.1	88	13
February-----	2.50	0.09	10.8	62.3	75.0	48.8	90	22
March-----	3.00	0.05	9.7	67.0	81.2	52.8	94	23
April-----	2.42	0.08	6.1	71.6	86.4	56.7	97	34
May-----	4.31	0.23	12.5	75.9	90.5	61.2	103	40
June-----	8.29	1.70	20.7	79.3	91.6	66.8	102	48
July-----	8.72	1.26	15.9	81.4	93.7	69.0	101	57
August-----	7.57	1.26	15.5	81.5	93.5	69.6	101	57
September-----	8.47	1.20	21.8	79.7	90.0	68.5	100	55
October-----	4.03	0.13	17.0	74.7	86.4	63.0	98	38
November-----	1.67	0.01	5.1	67.3	80.5	54.2	96	26
December-----	1.62	0.02	5.6	61.8	74.8	48.7	90	17

TABLE 2.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
1	Paola sand, 0 to 8 percent slopes-----	7,347	1.1
2	St. Lucie sand, 0 to 8 percent slopes-----	2,596	0.4
3	Basinger fine sand, depressional-----	16,192	2.5
4	Duette sand, 0 to 5 percent slopes-----	1,417	0.2
5	Daytona sand, 0 to 5 percent slopes-----	2,367	0.4
6	Tavares sand, 0 to 5 percent slopes-----	6,148	0.9
7	Placid fine sand, depressional-----	15,115	2.3
8	Immokalee sand-----	82,950	12.6
9	Astatula sand, 0 to 8 percent slopes-----	39,304	6.0
10	Myakka fine sand-----	85,118	12.9
11	Orsino sand, 0 to 5 percent slopes-----	2,026	0.3
12	Basinger fine sand-----	63,186	9.6
13	Felda fine sand-----	25,699	3.9
14	Satellite sand-----	28,397	4.3
15	Bradenton fine sand-----	5,402	0.8
16	Valkaria fine sand-----	24,931	3.8
17	Malabar fine sand-----	7,559	1.2
18	Kaliga muck-----	19,665	3.0
19	Hicoria mucky sand, depressional-----	7,899	1.2
20	Samsula muck-----	17,256	2.6
21	Hontoon muck-----	10,583	1.6
22	Brighton muck-----	7,823	1.2
23	Gator muck-----	10,430	1.6
24	Pineda sand-----	7,278	1.1
25	Chobee fine sandy loam, depressional-----	4,350	0.7
26	Tequesta muck-----	18,049	2.7
28	Archbold sand, 0 to 5 percent slopes-----	14,022	2.1
29	Pomona sand-----	1,479	0.2
30	Oldsmar fine sand-----	5,534	0.8
31	Felda fine sand, depressional-----	3,275	0.5
32	Arents, very steep-----	2,991	0.5
33	Basinger, St. Johns, and Placid soils-----	29,281	4.4
34	Tavares-Basinger-Sanibel complex, rolling-----	6,597	1.0
35	Sanibel muck-----	7,818	1.2
36	Pomello sand, 0 to 5 percent slopes-----	10,935	1.7
37	Malabar sand, depressional-----	1,552	0.2

TABLE 3.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Oranges	Grapefruit	Tomatoes	Watermelons	Bahiagrass
		<u>Boxes</u>	<u>Boxes</u>	<u>Tons</u>	<u>Tons</u>	<u>AUM*</u>
1----- Paola	VIIs	500	600	---	---	---
2----- St. Lucie	VIIIs	---	---	---	---	---
3----- Basinger	VIIw	---	---	---	---	---
4----- Duette	VIIs	350	450	---	---	5.0
5----- Daytona	VIIs	350	450	---	---	---
6----- Tavares	IIIIs	500	600	---	8	8.0
7----- Placid	VIIw	---	---	---	---	---
8----- Immokalee	IVw	350	550	15	9	---
9----- Astatula	VIIs	500	600	---	10	5.0
10----- Myakka	IVw	350	550	15	9	9.0
11----- Orsino	IVs	500	600	---	---	7.0
12----- Basinger	IVw	325	525	12	7	8.0
13----- Felda	IIIw	425	600	13	---	9.0
14----- Satellite	VIIs	---	---	---	5	5.0
15----- Bradenton	IIIw	450	600	---	---	9.0
16----- Valkaria	IVw	325	525	12	7	8.0
17----- Malabar	IVw	325	525	12	7	8.0
18----- Kaliga	IIIw	---	---	---	---	15.0
19----- Hicoria	VIIw	---	---	---	---	---

See footnote at end of table.

TABLE 3.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Tomatoes	Watermelons	Bahiagrass
		<u>Boxes</u>	<u>Boxes</u>	<u>Tons</u>	<u>Tons</u>	<u>AUM*</u>
20----- Samsula	IVw	---	---	---	---	15.0
21----- Hontoon	IIIw	---	---	---	---	15.0
22----- Brighton	IIIw	---	---	---	---	15.0
23----- Gator	IIIw	---	---	---	---	15.0
24----- Pineda	IIIw	425	600	13	9	9.0
25----- Chobee	VIIw	---	---	---	---	---
26----- Tequesta	IIIw	---	---	6	---	15.0
28----- Archbold	VI s	400	525	---	---	5.0
29----- Pomona	IVw	350	550	15	9	8.0
30----- Oldsmar	IVw	350	550	15	9	8.0
31----- Felda	VIIw	---	---	---	---	---
32. Arents						
33----- Basinger, St. Johns and Placid	IVw	325	525	12	7	15.0
34----- Tavares-Basinger-Sanibel	III s	500	600	---	---	---
35----- Sanibel	IIIw	---	---	---	---	15.0
36----- Pomello	VI s	350	450	---	---	---
37----- Malabar	VIIw	---	---	---	---	---
38----- EauGallie	IVw	350	550	15	9	8.0
39----- Smyrna	IVw	350	550	15	9	8.0
40. Arents						

See footnote at end of table.

TABLE 3.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Oranges	Grapefruit	Tomatoes	Watermelons	Bahiagrass
		<u>Boxes</u>	<u>Boxes</u>	<u>Tons</u>	<u>Tons</u>	<u>AUM*</u>
41----- Anclote-Basinger	VIw	---	---	---	---	---
42----- Astatula-Urban land	---	---	---	---	---	---
43. Urban land						
44----- Satellite-Basinger-Urban land	---	---	---	---	---	---
45----- Paola-Basinger	---	---	---	---	---	---
46----- Kaliga	VIIw	---	---	---	---	---

\* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 4.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence  
of an entry indicates no acreage]

Class	Total acreage	Major management concerns (Subclass)	
		Wetness (w)	Soil problem (s)
		<u>Acres</u>	<u>Acres</u>
I	---	---	---
II	---	---	---
III	119,895	112,747	7,148
IV	352,126	350,100	2,026
V	---	---	---
VI	106,146	2,357	103,789
VII	53,368	50,772	2,596
VIII	---	---	---

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES

[Only the soils that support rangeland vegetation suitable for grazing are listed]

Map symbol and	Range site	Total production		Characteristic vegetation	Compo-
		Favorable	Dry		
1----- Paola	Sand Pine Scrub-----	Favorable Normal Unfavorable	3,500 2,500 1,500	Lopsided indiangrass----- Pineland threeawn----- Grassleaf goldaster----- Creeping bluestem----- Beaked panicum----- Broomsedge bluestem----- Saw palmetto-----	10 10 10 10 5 5 5
2----- St. Lucie	Sand Pine Scrub-----	Favorable Normal Unfavorable	3,500 2,500 1,500	Lopsided indiangrass----- Pineland threeawn----- Grassleaf goldaster----- Creeping bluestem----- Beaked panicum----- Broomsedge bluestem----- Saw palmetto-----	10 10 10 10 5 5 5
3----- Basinger	Freshwater Marshes and Ponds--	Favorable Normal Unfavorable	10,000 7,500 5,000	Maidencane----- Blue maidencane----- Cutgrass----- Chalky bluestem----- Bluejoint panicum----- Sedges and rushes-----	50 10 10 5 5 5
4----- Duette	Sand Pine Scrub-----	Favorable Normal Unfavorable	3,500 2,500 1,500	Lopsided indiangrass----- Pineland threeawn----- Grassleaf goldaster----- Creeping bluestem----- Beaked panicum----- Broomsedge bluestem----- Saw palmetto-----	10 10 10 10 5 5 5
5----- Daytona	Sand Pine Scrub-----	Favorable Normal Unfavorable	3,500 2,500 1,500	Lopsided indiangrass----- Pineleaf threeawn----- Grassleaf goldaster----- Creeping bluestem----- Beaked panicum----- Broomsedge bluestem----- Saw palmetto-----	10 10 10 10 5 5 5
6----- Tavares	Longleaf Pine-Turkey Oak Hills	Favorable Normal Unfavorable	4,000 3,000 2,000	Creeping bluestem----- Lopsided indiangrass----- Grassleaf goldaster----- Pineland threeawn----- Broomsedge----- Pinewoods dropseed----- Purple bluestem-----	15 15 10 5 5 5 5
7-----	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50



TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Map symbol and soil name	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
9----- Astatula	Longleaf Pine-Turkey Oak Hills	Favorable	4,000	Creeping bluestem-----	15
		Normal	3,000	Lopsided indiangrass-----	15
		Unfavorable	2,000	Grassleaf goldaster-----	10
				Pineland threeawn-----	5
				Broomsedge-----	5
				Pinewoods dropseed-----	5
				Purple bluestem-----	5
10----- Myakka	South Florida Flatwoods-----	Favorable	6,000	Creeping bluestem-----	50
		Normal	4,500	Chalky bluestem-----	10
		Unfavorable	3,000	Lopsided indiangrass-----	10
				Pineland threeawn-----	5
				Saw palmetto-----	5
11----- Orsino	Sand Pine Scrub-----	Favorable	3,500	Lopsided indiangrass-----	10
		Normal	2,500	Pineland threeawn-----	10
		Unfavorable	1,500	Grassleaf goldaster-----	10
				Creeping bluestem-----	10
				Beaked panicum-----	5
				Broomsedge bluestem-----	5
				Saw palmetto-----	5
12----- Basinger	Slough-----	Favorable	8,000	Blue maidencane-----	50
		Normal	6,000	Chalky bluestem-----	10
		Unfavorable	4,000	Bluejoint panicum-----	5
				Pineland threeawn-----	5
				Yelloweyed grass-----	5
13----- Felda	Slough-----	Favorable	8,000	Blue maidencane-----	50
		Normal	6,000	Chalky bluestem-----	10
		Unfavorable	4,000	Bluejoint panicum-----	5
				Pineland threeawn-----	5
				Yelloweyed grass-----	5
14----- Satellite	Sand Pine Scrub-----	Favorable	3,500	Lopsided indiangrass-----	10
		Normal	2,500	Pineland threeawn-----	10
		Unfavorable	1,500	Grassleaf goldaster-----	10
				Creeping bluestem-----	10
				Broomsedge bluestem-----	5
				Saw palmetto-----	5
15----- Bradenton	Wetland Hardwood Hammock-----	Favorable	3,500	Longleaf uniola-----	20
		Normal	2,500	Eastern gamagrass-----	10
		Unfavorable	2,000	Chalky bluestem-----	10

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Map symbol and soil name	Range site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight Lb/acre		
18----- Kaliga	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
		Normal	7,500	Blue maidencane-----	10
		Unfavorable	5,000	Cutgrass-----	10
				Chalky bluestem-----	5
				Bluejoint panicum-----	5
				Sedges and rushes-----	5
19-----	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
20-----	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
20----- Samsula	Freshwater Marshes and Ponds--	Normal	7,500	Blue maidencane-----	10
		Unfavorable	5,000	Cutgrass-----	10
				Chalky bluestem-----	5
				Bluejoint panicum-----	5
				Sedges and rushes-----	5
21----- Hontoon	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
		Normal	7,500	Blue maidencane-----	10
		Unfavorable	5,000	Cutgrass-----	10
				Chalky bluestem-----	5
				Bluejoint panicum-----	5
				Sedges and rushes-----	5
22----- Brighton	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
		Normal	7,500	Blue maidencane-----	10
		Unfavorable	5,000	Cutgrass-----	10
				Chalky bluestem-----	5
				Bluejoint panicum-----	5

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Map symbol and soil name	Range site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight Lb/acre		
28----- Archbold	Sand Pine Scrub-----	Favorable	3,500	Lopsided indiangrass-----	10
		Normal	2,500	Pineland threeawn-----	10
		Unfavorable	1,500	Grassleaf goldaster-----	10
				Creeping bluestem-----	10
				Beaked panicum-----	5
				Broomsedge bluestem-----	5
				Saw palmetto-----	5
29----- Pomona	South Florida Flatwoods-----	Favorable	6,000	Creeping bluestem-----	50
		Normal	4,500	Lopsided indiangrass-----	10
		Unfavorable	3,000	Chalky bluestem-----	10
				Pineland threeawn-----	5
				Saw palmetto-----	5
				Beaked panicum-----	5
				Paspalum-----	5
30----- Oldsmar	South Florida Flatwoods-----	Favorable	6,000	Creeping bluestem-----	50
		Normal	4,500	Chalky bluestem-----	10
		Unfavorable	3,000	Lopsided indiangrass-----	10
				Pineland threeawn-----	5
				Saw palmetto-----	5
				Beaked panicum-----	5
31----- Felda	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
		Normal	7,500	Blue maidencane-----	10
		Unfavorable	7,000	Cutgrass-----	10
				Chalky bluestem-----	5
				Bluejoint panicum-----	5
				Sedges and rushes-----	5
33: Basinger St. Johns Placid	Cutthroat Seep-----	Favorable	9,000	Cutthroatgrass-----	50
		Normal	7,500	Chalky bluestem-----	15
		Unfavorable	6,000	Creeping bluestem-----	15
				Toothachegrass-----	10
				Panicums-----	5
35----- Sanibel	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
		Normal	7,500	Blue maidencane-----	10

TABLE 5.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Map symbol and soil name	Range site	Total production		Characteristic vegetation	Compo- sition
		Kind of year	Dry weight Lb/acre		
38----- EauGallie	South Florida Flatwoods-----	Favorable	6,000	Creeping bluestem-----	50
		Normal	4,500	Chalky bluestem-----	10
		Unfavorable	3,000	Lopsided indiagrass-----	10
				Pineland threeawn-----	5
				Saw palmetto-----	5
				Beaked panicum-----	5
39----- Smyrna	South Florida Flatwoods-----	Favorable	6,000	Creeping bluestem-----	50
		Normal	4,500	Chalky bluestem-----	10
		Unfavorable	3,000	Lopsided indiagrass-----	10
				Pineland threeawn-----	5
				Saw palmetto-----	5
				Beaked panicum-----	5
46----- Kaliga	Freshwater Marshes and Ponds--	Favorable	10,000	Maidencane-----	50
		Normal	7,500	Blue maidencane-----	10
		Unfavorable	5,000	Cutgrass-----	5
				Chalky bluestem-----	5
				Bluejoint panicum-----	5
				Sedges and rushes-----	5

## PRODUCTIVITY

Absence of an entry indicates that information was not

Potential productivity			Trees to plant
Common trees	Site index	Productivity class*	
and pine-----	50	2	Sand pine.
and live oak-----	---	---	
yrtle oak-----	---	---	
hapman oak-----	---	---	
urkey oak-----	---	---	
rub hickory-----	---	---	
uejack oak-----	---	---	
and pine-----	60	3	Sand pine.
and live oak-----	---	---	
apman oak-----	---	---	
yrtle oak-----	---	---	
ondcypress-----	75	2	**
aldcypress-----	---	---	
lackgum-----	---	---	
abbage palm-----	---	---	
arolina ash-----	---	---	
oblollybay gordonia	---	---	
ed maple-----	---	---	
weetbay-----	---	---	
lash pine-----	59	6	Slash pine, South Florida slash pine, longleaf pine.
and pine-----	45	2	
and live oak-----	---	---	
hapman oak-----	---	---	
yrtle oak-----	---	---	
and pine-----	66	4	Slash pine, South Florida slash pine, longleaf pine.
and live oak-----	---	---	
apman oak-----	---	---	
yrtle oak-----	---	---	
lash pine-----	80	10	Slash pine, South Florida slash pine, longleaf pine.
ongleaf pine-----	70	6	
uth Florida slash	45	4	
pine-----	---	---	
urkey oak-----	---	---	**
ondcypress-----	75	2	
aldcypress-----	---	---	
lackgum-----	---	---	
arolina ash-----	---	---	
oblollybay gordonia	---	---	
ed maple-----	---	---	
weetbay-----	---	---	

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TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	Productivity class*	
15----- Bradenton	11W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine----- Live oak----- Cabbage palm-----	90 75 70 --- ---	11 6 --- --- ---	Slash pine, South Florida slash pine.
16----- Valkaria	8W	Slight	Severe	Moderate	Slight	Moderate	Slash pine----- South Florida slash pine-----	70 35	8 3	Slash pine, South Florida slash pine.
17----- Malabar	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----- South Florida slash pine----- Cabbage palm-----	80 45 ---	10 4 ---	Slash pine, South Florida slash pine.
18----- Kaliga	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress----- Blackgum----- Red maple----- Pondcypress----- Sweetbay-----	100 --- --- --- ---	6 --- --- --- ---	**
19----- Hicoria	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress----- Baldcypress----- Blackgum----- Loblolly bay----- Red maple----- Sweetbay----- Redbay-----	75 --- --- --- --- --- ---	2 --- --- --- --- --- ---	**
20----- Samsula	2W	Slight	Severe	Severe	Severe	Severe	Pondcypress----- Red maple----- Sweetbay-----	75 --- ---	2 --- ---	**
21----- Hontoon	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress----- Blackgum----- Carolina ash----- Loblollybay gordonia Red maple----- Sweetbay----- Cypress----- Pondcypress-----	100 --- --- --- --- --- --- ---	6 --- --- --- --- --- --- ---	**

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	Productivity class*	
22----- Brighton	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress----- Blackgum----- Pondcypress----- Loblollybay gordonia Red maple----- Sweetbay----- Carolina ash----- Red bay-----	100 --- --- --- --- --- --- ---	6 --- --- --- --- --- --- ---	**
23----- Gator	2W	Slight	Severe	Severe	Severe	Severe	Pondcypress----- Red maple----- Sweetbay----- Cabbage palm----- Baldcypress-----	75 --- --- --- ---	2 --- --- --- ---	**
24----- Pineda	10W	Slight	Moderate	Severe	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine----- Cabbage palm----- Water oak-----	80 70 45 --- ---	10 6 4 --- ---	Slash pine, South Florida slash pine.
25----- Chobee	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress----- Baldcypress----- Blackgum----- Cabbage palm----- Carolina ash----- Loblollybay gordonia Red maple----- Sweetbay-----	75 --- --- --- --- --- --- ---	2 --- --- --- --- --- --- ---	**
26----- Tequesta	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress----- Baldcypress----- Blackgum----- Cabbage palm----- Carolina ash----- Loblolly pine----- Red maple----- Sweetbay-----	75 --- --- --- --- --- --- ---	2 --- --- --- --- --- --- ---	**
28----- Archbold	3S	Slight	Severe	Moderate	Slight	Slight	Sand pine----- South Florida slash pine----- Myrtle oak----- Chapman oak----- Sand live oak-----	60 35 --- --- ---	3 3 --- --- ---	Sand pine, slash pine, South Florida slash pine.

See footnotes at end of table.



TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	Productivity class*	
29----- Pomona	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine-----	80 70 45	10 6 4	Slash pine, South Florida slash pine.
30----- Oldsmar	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine-----	80 65 45	10 5 4	Slash pine, South Florida slash pine.
31----- Felda	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress----- Baldcypress----- Blackgum----- Cabbage palm----- Loblollybay gordonia----- Red maple----- Sweetbay----- Red bay-----	75 --- --- --- --- --- --- ---	2 --- --- --- --- --- --- ---	**
33: Basinger-----	8W	Slight	Severe	Severe	Slight	Severe	Slash pine----- Longleaf pine----- South Florida slash pine-----	70 60 35	8 4 3	Slash pine, South Florida slash pine.
St. Johns-----	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine-----	80 70 45	10 6 4	Slash pine, South Florida slash pine.
Placid-----	11W	Slight	Severe	Severe	Slight	Severe	Slash pine----- Longleaf pine----- South Florida slash pine-----	84 80 55	11 7 ---	Slash pine, South Florida slash pine.
35----- Sanibel	3W	Slight	Severe	Severe	Moderate	Severe	Pondcypress----- Carolina ash----- Blackgum-----	75 --- ---	3 --- ---	**
36----- Pomello	8S	Slight	Moderate	Severe	Slight	Moderate	Slash pine----- Longleaf pine----- Sand pine----- South Florida slash pine----- Chapman oak----- Myrtle oak----- Sand live oak-----	70 60 60 35 --- --- ---	8 4 3 3 --- --- ---	Slash pine, South Florida slash pine, longleaf pine.

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns					Potential productivity			Trees to plant
		Erosion hazard	Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	Productivity class*	
37----- Malabar	2W	Slight	Severe	Severe	Moderate	Severe	Pondcypress----- Baldcypress----- Blackgum----- Cabbage palm----- Carolina ash----- Loblollybay gordonia Red maple----- Sweetbay-----	75 --- --- --- --- --- --- ---	2 --- --- --- --- --- --- ---	**
38----- EauGallie	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine-----	80 70 45	10 6 4	Slash pine, South Florida slash pine.
39----- Smyrna	10W	Slight	Moderate	Moderate	Slight	Moderate	Slash pine----- Longleaf pine----- South Florida slash pine-----	80 70 45	10 6 4	Slash pine, South Florida slash pine.
41: Anclote-----	6W	Slight	Severe	Severe	Moderate	Severe	Baldcypress----- Blackgum----- Water oak----- Red maple----- Sweetbay----- Laurel oak----- Pondcypress-----	100 --- --- --- --- --- ---	6 --- --- --- --- --- ---	**
Basinger-----	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress----- Water oak----- Blackgum----- Laurel oak----- Red maple----- Carolina ash-----	100 --- --- --- --- ---	6 --- --- --- --- ---	**
46----- Kaliga	6W	Slight	Severe	Severe	Severe	Severe	Baldcypress----- Pondcypress----- Blackgum----- Sweetbay----- Loblollybay gordonia Red maple-----	100 --- --- --- --- ---	6 --- --- --- --- ---	**

\* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

\*\* No recommended trees to plant because of severe ratings for management concerns.

TABLE 7.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "moderate" and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1----- Paola	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
2----- St. Lucie	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
3----- Basinger	Severe: ponding.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
4----- Duette	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
5----- Daytona	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
6----- Tavares	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
7----- Placid	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
8----- Immokalee	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
9----- Astatula	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
10----- Myakka	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
11----- Orsino	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
12----- Basinger	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
13----- Felda	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
14----- Satellite	Severe: wetness, too sandy.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
15----- Bradenton	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
16----- Valkaria	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
17----- Malabar	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
18----- Kaliga	Severe: ponding, excess humus, percs slowly.	Severe: ponding, excess humus, percs slowly.	Severe: excess humus, ponding, percs slowly.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
19----- Hicoria	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
20----- Samsula	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
21----- Hontoon	Severe: excess humus,	Severe: excess humus,	Severe: excess humus,	Severe: excess humus,	Severe: ponding,

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
33: Basinger-----	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
St. Johns-----	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Placid-----	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
34: Tavares-----	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
Basinger-----	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
Sanibel-----	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
35----- Sanibel	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
36----- Pomello	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
37----- Malabar	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding, droughty.
38----- EauGallie	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, droughty.
39----- Smyrna	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness.
40----- Arents	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness.
41: Anclothe-----	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
Basinger-----	Severe: flooding, wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.

TABLE 7.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
42: Astatula-----	Severe:	Severe:	Severe:	Severe:	Severe:
	too much water	too sandy	too sandy	too sandy	droughty

TABLE 8.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
1----- Paola	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
2----- St. Lucie	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
3----- Basinger	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
4----- Duette	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
5----- Daytona	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
6----- Tavares	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
7----- Placid	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
8----- Immokalee	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Poor	Poor	Poor.
9----- Astatula	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
10----- Myakka	Poor	Fair	Fair	Poor	Poor	Fair	Poor	Fair	Poor	Poor.
11----- Orsino	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
12----- Basinger	Poor	Poor	Fair	Poor	Poor	Good	Fair	Poor	Poor	Fair.
13----- Felda	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Poor	Fair.
14----- Satellite	Very poor.	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
15----- Bradenton	Poor	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Poor.
16----- Valkaria	Poor	Fair	Fair	Fair	Fair	Good	Fair	Poor	Poor	Good.
17----- Malabar	Poor	Poor	Poor	Poor	Poor	Fair	Fair	Poor	Poor	Fair.
18----- Kaliga	Fair	Fair	---	---	---	Good	Good	Fair	---	Good.
19----- Hicoria	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.

TABLE 8.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hard-wood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
20----- Samsula	Fair	Good	---	---	---	Good	Good	Good	---	Good.
21----- Hontoon	Fair	Good	---	---	---	Good	Good	Good	---	Good.
22----- Brighton	Fair	Good	---	---	---	Good	Good	Good	---	Good.
23----- Gator	Fair	Good	---	---	---	Good	Good	Good	---	Good.
24----- Pineda	Poor	Fair	Fair	Poor	Poor	Good	Fair	Fair	Poor	Fair.
25----- Chobee	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good	Good	Very poor.	Poor	Good.
26----- Tequesta	Fair	Good	---	---	---	Good	Good	Good	---	Good.
28----- Archbold	Very poor.	Poor	Poor	Very poor.	Poor	Very poor.	Very poor.	Poor	Very poor.	Very poor.
29----- Pomona	Poor	Fair	Fair	Poor	Poor	Fair	Fair	Fair	Poor	Fair.
30----- Oldsmar	Poor	Fair	Fair	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
31----- Feldt	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.



TABLE 8.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
38----- Eau Gallie	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor
39----- Smyrna	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair
40. Arents										
41: Anclote-----	Very poor.	Very poor.	Poor	Fair	Poor	Good	Good	Very poor.	Poor	Good
Basinger-----	Very poor.	Very poor.	Poor	Fair	Poor	Fair	Fair	Very poor.	Poor	Fair
42: Astatula-----	Poor	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Urban land.										
43. Urban land										
44: Satellite-----	Very poor.	Poor	Poor	Poor	Poor	Poor	Very poor.	Poor	Poor	Very poor.
Basinger-----	Poor	Poor	Fair	Poor	Poor	Good	Fair	Poor	Poor	Fair
Urban land.										
45: Paola-----	Very poor.	Poor	Poor	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
Basinger-----	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good
46----- Kaliga	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Good	Good	Very poor.	Poor	Good

TABLE 9.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1----- Paola	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Severe: droughty.
2----- St. Lucie	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Severe: droughty.
3----- Basinger	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
4----- Duette	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
5----- Daytona	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
6----- Tavares	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
7----- Placid	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
8----- Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
9----- Astatula	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Severe: droughty.
10----- Myakka	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
11----- Orsino	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
12----- Basinger	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
13----- Felda	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
14----- Satellite	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
15----- Bradenton	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
16----- Valkaria	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

[illegible]

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
32----- Arents	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
33: Basinger-----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
St. Johns-----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Placid-----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
34: Tavares-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Moderate: slope.	Slight-----	Severe: droughty.
Basinger-----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Sanibel-----	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
35----- Sanibel	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, excess humus.
36----- Pomello	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
37----- Malabar	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, droughty.
38----- EauGallie	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
39----- Smyrna	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
40----- Arents	Severe: cutbanks cave, excess humus.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Moderate: wetness.
41: Anclote-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Basinger-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.

TABLE 9.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
42: Astatula-----  Urban land.	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Severe: droughty.
43. Urban land						
44: Satellite-----  Basinger-----  Urban land.	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
45: Paola-----  Basinger-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
46----- Kaliga	Severe: cutbanks cave, excess humus, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, wetness, flooding.	Severe: wetness, flooding, excess humus.

TABLE 10.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "poor," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1----- Paola	Slight*-----	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
2----- St. Lucie	Slight*-----	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
3----- Basinger	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
4----- Duette	Moderate*: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
5----- Daytona	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
6----- Tavares	Moderate*: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
7----- Placid	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
8----- Immokalee	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
9----- Astatula	Slight*-----	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
10----- Myakka	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
11----- Orsino	Moderate*: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
12----- Basinger	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
13----- Felda	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
14----- Satellite	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
15----- Bradenton	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
16----- Valkaria	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
17----- Malabar	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
18----- Kaliga	Severe: ponding, percs slowly, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too clayey.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
19----- Hicoria	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.
20----- Samsula	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
21----- Hontoon	Severe: subsides, ponding, poor filter.	Severe: excess humus, seepage, ponding.	Severe: excess humus, seepage, ponding.	Severe: seepage, ponding.	Poor: excess humus, ponding.
22----- Brighton	Severe: subsides, ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
23----- Gator	Severe: ponding, percs slowly, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: ponding, thin layer.
24----- Pineda	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
25----- Chobee	Severe: ponding, percs slowly.	Severe: seepage, ponding.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, ponding.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
26----- Tequesta	Severe: ponding, percs slowly, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: ponding, seepage, too sandy.
28----- Archbold	Moderate*: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
29----- Pomona	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
30----- Oldsmar	Severe: wetness, percs slowly.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
31----- Felda	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
32----- Arents	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: seepage, slope.
33: Basinger-----	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
St. Johns-----	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Placid-----	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, ponding, too sandy.	Severe: seepage, wetness.	Poor: wetness, too sandy, seepage.
34: Tavares-----	Moderate*: wetness.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Basinger-----	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Sanibel-----	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.

See footnote at end of table.



TABLE 10.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
35----- Sanibel	Severe: ponding, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
36----- Pomello	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
37----- Malabar	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
38----- EauGallie	Severe: wetness.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
39----- Smyrna	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
40----- Arents	Severe: wetness, poor filter.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Poor: hard to pack.
41: Anclote-----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Basinger-----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
42: Astatula-----	Slight*-----	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Urban land.					
43. Urban land					
44: Satellite-----	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Basinger-----	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.

See footnote at end of table.

TABLE 10.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
44. Urban land					
45:					

TABLE 11.--CONSTRUCTION MATERIALS

"poor," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1----- Paola	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
2----- St. Lucie	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
3----- Basinger	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
4----- Duette	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
5----- Daytona	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
6----- Tavares	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
7----- Placid	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
17----- Malabar	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
18----- Kaliga	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
19----- Hicoria	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
20----- Samsula	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: excess humus, wetness.
21----- Hontoon	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: wetness, excess humus.
22----- Brighton	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
23----- Gator	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: excess humus, wetness.
24----- Pineda	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
25----- Chobee	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
26----- Tequesta	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
28----- Archbold	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
29----- Pomona	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
30----- Oldsmar	Poor: wetness.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, wetness.
31----- Felda	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
32----- Arents	Poor: slope.	Probable-----	Improbable: too sandy.	Poor: slope.
33: Basinger-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
33: St. Johns-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
Placid-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
34: Tavares-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
Basinger-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
Sanibel-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
35----- Sanibel	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
36----- Pomello	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy.
37----- Malabar	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
38----- EauGallie	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
39----- Smyrna	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
40----- Arents	Fair: thin layer.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
41: Anclote-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
Basinger-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
42: Astatula-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
Urban land.				
43. Urban land				

TABLE 11.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
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Satellite-----	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy.
Basinger-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
Urban land.				
45: Paola-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
Basinger-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, wetness.
46----- Kaliga	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: excess humus,

TABLE 12.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1----- Paola	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
2----- St. Lucie	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
3----- Basinger	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
4----- Duette	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
5----- Daytona	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
6----- Tavares	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
7----- Placid	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
8----- Immokalee	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
9----- Astatula	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
10----- Myakka	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.

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Terraces and diversions	Grassed waterways
po sandy, soil blowing.	Droughty.
etness, too sandy, soil blowing.	Wetness, droughty.
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etness, too sandy, soil blowing.	Wetness, droughty.
etness, too sandy.	Wetness, droughty.
etness, too sandy, soil blowing.	Wetness, droughty.
etness, too sandy, soil blowing.	Wetness, droughty.
onding, soil blowing, percs slowly.	Wetness, percs slowly.
onding, soil blowing, percs slowly.	Wetness, rooting depth.
onding, soil blowing.	Wetness.



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Terraces and diversions	Grassed waterways
Wetness, too sandy, soil blowing.	Wetness, droughty.
Wetness, too sandy.	Wetness.
Wetness, too sandy, soil blowing.	Wetness.
Too sandy, soil blowing.	Droughty.
Wetness, too sandy, soil blowing.	Wetness, droughty.
Ponding, too sandy, soil blowing.	Wetness, droughty.
Ponding, too sandy, soil blowing.	Wetness, droughty.
Wetness, too sandy, soil blowing.	Droughty.
Ponding, too sandy, soil blowing.	Wetness, droughty.
Wetness, too sandy, soil blowing.	Wetness, droughty.

TABLE 12.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
39----- Smyrna	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
40----- Arents	Severe: seepage.	Severe: seepage, hard to pack.	Moderate: deep to water.	Cutbanks cave	Droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
41: Anclothe-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Basinger-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
42: Astatula-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
Urban land.							
43. Urban land							
44: Satellite-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Basinger-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Urban land.							

Grassed  
waterways

Slope,  
droughty.

Wetness,  
droughty.

Wetness.

TABLE 13.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils may have Unified classifications and USDA textures in addition to those shown. In general, the dominant classifications and textures are shown]

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches  Pct	Percentage passing sieve number--				Liquid limit  Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
1----- Paola	0-5 5-17 17-80	Sand----- Sand, fine sand Sand, fine sand	SP SP SP	A-3 A-3 A-3	0 0 0	100 100 100	100 100 100	85-100 85-100 80-100	1-2 1-2 1-4	--- --- ---	NP NP NP
2----- St. Lucie	0-6 6-80	Sand----- Sand, fine sand	SP SP	A-3 A-3	0 0	100 100	90-100 90-100	75-99 75-99	1-4 1-4	--- ---	NP NP
3----- Basinger	0-6 6-80	Fine sand----- Sand, fine sand	SP SP, SP-SM	A-3 A-3, A-2-4	0 0	100 100	100 100	85-100 85-100	1-4 2-12	--- ---	NP NP
4----- Duette	0-6 6-51 51-80	Sand----- Fine sand, sand Fine sand, sand	SP SP SP, SP-SM	A-3 A-3 A-3, A-2-4	0 0 0	100 100 100	100 100 100	60-100 60-100 60-100	1-4 1-4 4-12	--- --- ---	NP NP NP
5----- Daytona	0-36 36-59 59-80	Sand, fine sand Sand, fine sand Sand, fine sand, coarse sand.	SP, SP-SM SP-SM SP, SP-SM	A-3 A-3, A-2-4 A-3	0 0 0	100 100 100	100 100 100	70-95 70-95 70-95	1-10 5-12 4-10	--- --- ---	NP NP NP
6----- Tavares	0-6 6-80	Sand----- Sand, fine sand	SP, SP-SM SP, SP-SM	A-3 A-3	0 0	100 100	95-100 95-100	80-100 80-100	2-10 2-10	--- ---	NP NP
7----- Placid	0-11 11-80	Fine sand----- Sand, fine sand, loamy fine sand.	SP, SP-SM, SM SP, SP-SM, SM	A-3, A-2-4 A-3, A-2-4	0 0	100 100	100 100	90-100 90-100	1-20 1-20	--- ---	NP NP
8----- Immokalee	0-6 6-37 37-80	Sand----- Fine sand, sand Fine sand, sand	SP, SP-SM SP, SP-SM SP-SM, SM	A-3 A-3 A-3, A-2-4	0 0 0	100 100 100	100 100 100	70-100 70-100 70-100	2-10 2-10 5-21	--- --- ---	NP NP NP
9----- Astatula	0-7 7-80	Sand----- Sand, fine sand	SP, SP-SM SP, SP-SM	A-3 A-3	0 0	100 100	100 100	75-99 75-99	1-7 1-7	--- ---	NP NP
10----- Myakka	0-24 24-58 58-80	Fine sand----- Sand, fine sand, loamy fine sand. Sand, fine sand	SP, SP-SM SM, SP-SM SP, SP-SM	A-3 A-3, A-2-4 A-3	0 0 0	100 100 100	100 100 100	85-100 85-100 85-100	2-10 5-20 2-8	--- --- ---	NP NP NP
11----- Orsino	0-46 46-80	Sand----- Sand, fine sand	SP SP, SP-SM	A-3 A-3	0 0	100 100	100 100	85-95 85-100	1-3 2-10	--- ---	NP NP
12----- Basinger	0-6 6-80	Fine sand----- Sand, fine sand	SP SP, SP-SM	A-3 A-3, A-2-4	0 0	100 100	100 100	85-100 85-100	1-4 2-12	--- ---	NP NP

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In										
13----- Felda	0-24	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-99	2-5	---	NP
	24-36	Sandy loam, very fine sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-99	15-35	<40	NP-15
	36-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-99	2-12	---	NP
14----- Satellite	0-4	Sand-----	SP	A-3	0	100	100	80-95	1-4	---	NP
	4-80	Sand, fine sand	SP	A-3	0	100	100	80-95	1-4	---	NP
15----- Bradenton	0-4	Fine sand-----	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	4-14	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	80-100	5-12	---	NP
	14-44	Sandy loam, very fine sandy loam, fine sandy loam, loamy fine sand.	SC, SM-SC	A-2-4, A-2-6	0	100	100	80-100	20-35	<40	NP-18
	44-80	Fine sand, loamy fine sand, fine sandy loam, very fine sandy loam.	SP-SM, SM, SM-SC, SC	A-3, A-2-4, A-2-6	0	100	100	80-100	5-35	<40	NP-18
16----- Valkaria	0-5	Fine sand-----	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
	5-16	Sand, fine sand	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
	16-51	Sand, fine sand	SP, SP-SM	A-3	0	100	75-100	75-100	3-10	---	NP
	51-80	Sand, fine sand	SP, SP-SM	A-3	0	100	75-100	75-100	2-10	---	NP
17----- Malabar	0-4	Fine sand-----	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	4-14	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	3-12	---	NP
	14-48	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	48-80	Sandy clay loam, fine sandy loam, sandy loam.	SC, SM-SC, SM	A-2, A-4, A-6	0	100	100	80-100	20-40	<35	NP-20
18----- Kaliga	0-39	Muck-----	PT	---	---	---	---	---	---	---	---
	39-45	Fine sandy loam, loamy fine sand, very fine sand.	SM, SM-SC, SC	A-2-4, A-2-6, A-4, A-6	0	100	100	90-100	13-50	<40	NP-15
	45-68	Sandy clay, clay, sandy clay loam, very fine sandy loam.	SC, CL, CH	A-7, A-4, A-6	0	100	100	75-100	36-85	20-73	8-40
	68-80	Fine sandy loam, sandy loam, loamy sand, very fine sand.	SM, SM-SC	A-2-4	0	100	100	75-100	13-35	<28	NP-7
19----- Hicoria	0-4	Mucky sand-----	SP-SM, SM, SM-SC	A-3, A-2-4	0	100	100	90-100	5-20	<20	NP-5
	4-21	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-20	---	NP
	21-52	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-2-4, A-2-6, A-4, A-6	0	100	100	90-100	20-40	<30	NP-15
	52-80	Sand, fine sandy loam, sandy clay loam.	SM-SC, SC, SM, SP-SM	A-3, A-2-4, A-2-6	0	100	100	90-100	5-35	<30	NP-15

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
20----- Samsula	0-36 36-65	Muck----- Sand, fine sand	PT SP-SM, SM, SP	--- A-3, A-2-4	--- 0	--- 100	--- 100	--- 80-100	--- 2-20	--- ---	--- NP
21----- Hontoon	0-65 65-80	Muck----- Mucky sand, sand, loamy sand.	PT SP, SP-SM, SM	A-8 A-3, A-2-4	0 0	--- 100	--- 100	--- 60-95	--- 2-20	--- ---	--- NP
22----- Brighton	0-12 12-80	Muck----- Mucky-peat-----	PT PT	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
23----- Gator	0-18 18-55 55-80	Muck----- Loam, fine sandy loam, sandy clay loam. Fine sand, sand	PT SM-SC, SC, SM SM, SP-SM	A-8 A-2-4, A-2-6 A-3, A-2-4	0 0 0	--- 100 100	--- 100 100	--- 80-99 85-100	--- 25-35 7-15	--- <40 ---	--- NP-15 NP
24----- Pineda	0-4 4-30 30-56 56-80	Sand----- Sand, fine sand Sandy loam, fine sandy loam, sandy clay loam. Sand, loamy sand, fine sand.	SP, SP-SM SP, SP-SM SC, SM-SC, SM SP-SM, SM, SP	A-3 A-3 A-2-4, A-2-6 A-3, A-2-4	0 0 0 0	100 100 100 95-100	100 100 100 90-100	80-95 80-95 65-95 80-95	2-8 2-10 15-35 4-15	--- --- <35 ---	NP NP NP-20 NP
25----- Chobee	0-18 18-57 57-80	Fine sandy loam Sandy loam, fine sandy loam, sandy clay loam. Sand, fine sand, loamy sand.	SP-SM, SM SP-SM, SM, SC, SM-SC SP-SM, SM, SP	A-2-4 A-2-4, A-2-6, A-6, A-7 A-3, A-2-4	0 0 0	100 100 95-100	100 100 90-100	85-100 85-100 80-95	12-25 12-45 4-15	<40 <45 ---	NP-10 NP-25 NP
26----- Tequesta	0-12 12-32 32-77 77-80	Muck----- Sand, fine sand Sandy loam, sandy clay loam, fine sandy loam. Sand, fine sand, loamy sand.	PT SP, SP-SM SM, SM-SC, SC SP, SP-SM, SM	--- A-3, A-2-4 A-2-4, A-2-6 A-3, A-2-4, A-1-B	0 0 0 0	--- 100 100 60-100	--- 100 100 50-100	--- 80-100 80-100 40-80	--- 2-12 15-35 3-20	--- --- <40 ---	--- NP NP-20 NP
28----- Archbold	0-4 4-80	Sand----- Sand, fine sand	SP SP	A-3 A-3	0 0	100 100	100 100	89-100 89-100	1-3 1-3	--- ---	NP NP
29----- Pomona	0-6 6-29 29-51 51-61 61-80	Sand----- Sand, fine sand Sand, fine sand Sand, fine sand Sandy clay loam, sandy loam, sandy clay.	SP, SP-SM SP, SP-SM SP-SM, SM SP, SP-SM SC, SM-SC, SM	A-3, A-2-4 A-3, A-2-4 A-3, A-2-4 A-2, A-4, A-6	0 0 0 0 0	100 100 100 100 100	100 100 100 100 95-100	85-100 85-100 85-100 85-100 85-100	2-12 2-12 5-15 2-12 25-50	--- --- --- --- <40	NP NP NP NP NP-16

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>										
30----- Oldsmar	0-32	Fine sand-----	SP, SP-SM	A-3	0	100	100	80-100	2-10	---	NP
	32-54	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2-4, A-3	0	100	100	80-100	5-20	---	NP
	54-60	Fine sandy loam, sandy loam, sandy clay loam.	SM-SC, SC	A-2-4, A-2-6	0	100	100	85-100	20-35	20-35	5-15
31----- Felda	0-5	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-5	---	NP
	5-31	Sand, fine sand	SP, SP-SM	A-3	0	100	100	90-100	2-5	---	NP
	31-70	Sandy loam, very fine sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-2-6	0	100	100	90-100	15-35	<40	NP-15
	70-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
32----- Arents	0-80	Variable-----	SP, SP-SM, SM	A-3, A-2-4	0	95-100	75-95	60-90	2-25	---	NP
33: Basinger-----	0-6	Fine sand-----	SP	A-3	0	100	100	85-100	1-4	---	NP
	6-80	Sand, fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
St. Johns-----	0-11	Sand-----	SP, SP-SM	A-3	0	100	100	75-95	3-10	---	NP
	11-26	Sand, fine sand	SP, SP-SM	A-3	0	100	100	85-95	3-10	---	NP
	26-49	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
	49-70	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-90	2-10	---	NP
	70-80	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	85-95	5-20	---	NP
Placid-----	0-14	Sand-----	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
	14-80	Fine sand, sand, loamy fine sand.	SP, SP-SM, SM	A-3, A-2-4	0	100	100	90-100	1-20	---	NP
34: Tavares-----	0-6	Sand-----	SP, SP-SM	A-3	0	100	95-100	80-100	2-10	---	NP
	6-80	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	80-100	2-10	---	NP
Basinger-----	0-6	Fine sand-----	SP	A-3	0	100	100	85-100	1-4	---	NP
	6-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
Sanibel-----	0-8	Muck-----	PT	---	0	---	---	---	---	---	---
	8-15	Sand, fine sand, mucky fine sand.	SP, SP-SM	A-3	0	100	100	80-95	1-10	---	NP
	15-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-95	1-10	---	NP
35----- Sanibel	0-8	Muck-----	PT	---	0	---	---	---	---	---	---
	8-15	Sand, fine sand, mucky fine sand.	SP, SP-SM	A-3	0	100	100	80-95	1-10	---	NP
	15-80	Sand, fine sand	SP, SP-SM	A-3	0	100	100	80-95	1-10	---	NP



TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

[illegible]

TABLE 13.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
45:											
Paola-----	0-5	Sand-----	SP	A-3	0	100	100	85-100	1-2	---	NP
	5-17	Sand, fine sand	SP	A-3	0	100	100	85-100	1-2	---	NP
	17-80	Sand, fine sand	SP	A-3	0	100	100	80-100	1-4	---	NP
Basinger-----	0-6	Sand-----	SP	A-3	0	100	100	85-100	1-4	---	NP
	6-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	85-100	2-12	---	NP
46-----											
Kaliga	0-39	Muck-----	PT	---	---	---	---	---	---	---	---
	39-45	Loam, fine sandy loam, loamy sand, very fine sand.	SM, SM-SC SC	A-2-4, A-2-6, A-4, A-6	0	100	100	90-100	13-50	<40	NP-15
	45-68	Sandy clay, clay, sandy clay loam, very fine sandy loam.	SC, CL, CH	A-7, A-4, A-6	0	100	100	75-100	36-85	20-73	8-40
	68-80	Fine sandy loam, sandy loam, loamy sand, very fine sand.	SM, SM-SC	A-2-4	0	100	100	75-100	13-35	<28	NP-7

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	G/cc	In/hr	In/in	pH					Pct
1----- Paola	0-5 5-17 17-80	0-2 0-2 0-3	1.20-1.45 1.45-1.60 1.45-1.60	>20 >20 >20	0.02-0.05 0.02-0.05 0.02-0.05	3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low-----	0.10 0.10 0.10	5	1	<.5
2----- St. Lucie	0-4 4-80	0-1 0-1	1.40-1.60 1.50-1.60	>20 >20	0.02-0.05 0.02-0.03	3.6-7.3 3.6-7.3	Low----- Low-----	0.10 0.10	5	1	0-1
3----- Basinger	0-6 6-16 16-48 48-80	0-4 0-4 1-3 1-3	1.40-1.55 1.40-1.60 1.40-1.65 1.50-1.70	6.0-20 6.0-20 6.0-20 6.0-20	0.05-0.10 0.05-0.10 0.10-0.15 0.05-0.10	3.6-7.3 3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low----- Low-----	0.10 0.10 0.10 0.10	5	2	1-8
4----- Duette	0-6 6-51 51-80	0-2 0-2 1-5	1.25-1.55 1.40-1.70 1.45-1.60	>20 >20 2.0-6.0	0.03-0.06 0.02-0.05 0.10-0.15	4.5-7.0 4.5-7.0 4.5-6.5	Low----- Low----- Low-----	0.10 0.10 0.10	5	1	<1
5----- Daytona	0-36 36-59 59-80	0-3 2-6 1-4	1.20-1.50 1.35-1.60 1.45-1.70	>20 2.0-6.0 >20	0.02-0.05 0.10-0.15 0.02-0.05	3.6-6.0 3.6-6.0 3.6-6.0	Low----- Low----- Low-----	0.10 0.15 0.10	5	1	.5-1
6-----	0-6	0-4	1.25-1.60	>6.0	0.05-0.10	3.6-6.0	Low-----	0.10	5	2	.5-2
Tavares	6-80	0-4	1.40-1.70	>6.0	0.02-0.05	3.6-6.0	Low-----	0.10			
7----- Placid	0-11 11-80	1-10 1-10	0.70-1.40 1.30-1.75	6.0-20 6.0-20	0.15-0.20 0.05-0.08	3.6-5.5 3.6-6.5	Low----- Low-----	0.10 0.10	5	2	2-10
8----- Immokalee	0-6 6-37 37-80	1-5 1-5 2-7	1.20-1.50 1.45-1.70 1.30-1.60	6.0-20 6.0-20 0.6-2.0	0.05-0.10 0.02-0.05 0.10-0.25	3.6-6.0 3.6-6.0 3.6-6.0	Low----- Low----- Low-----	0.10 0.10 0.15	5	2	1-2
9----- Astatula	0-7 7-80	1-3 1-3	1.25-1.60 1.45-1.60	>20 >20	0.04-0.10 0.02-0.05	4.5-6.5 4.5-6.5	Low----- Low-----	0.10 0.10	5	2	.5-2
10----- Myakka	0-24 24-58 58-80	0-2 1-8 0-2	1.35-1.45 1.45-1.60 1.48-1.60	6.0-20 6.0-20 0.6-6.0	0.05-0.15 0.02-0.05 0.10-0.20	3.6-6.5 3.6-6.5 3.6-6.5	Low----- Low----- Low-----	0.10 0.10 0.15	5	2	2-5
11----- Orsino	0-46 46-80	0-1 0-2	1.35-1.55 1.35-1.55	>20 >20	0.02-0.08 0.02-0.08	3.6-6.0 3.6-6.0	Low----- Low-----	0.10 0.10	5	2	<1
12----- Basinger	0-6 6-21 21-52 52-80	0-4 0-4 1-6 1-3	1.40-1.55 1.40-1.55 1.40-1.65 1.50-1.70	6.0-20 6.0-20 6.0-20 6.0-20	0.03-0.07 0.05-0.10 0.10-0.15 0.05-0.10	3.6-8.4 3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low----- Low-----	0.10 0.10 0.10 0.10	5	2	.5-2
13----- Felda	0-24 24-36 36-80	1-3 13-30 1-10	1.30-1.55 1.50-1.65 1.50-1.65	6.0-20 0.6-6.0 6.0-20	0.02-0.05 0.10-0.15 0.02-0.05	4.5-7.3 6.1-7.8 6.1-8.4	Low----- Low----- Low-----	0.10 0.24 0.10	5	2	1-4
14----- Satellite	0-4 4-80	1-3 0-2	1.10-1.55 1.35-1.55	>20 >20	0.02-0.10 0.02-0.05	4.5-7.8 4.5-7.8	Low----- Low-----	0.10 0.10	5	2	.5-2
15----- Bradenton	0-4 4-14 14-44 44-80	1-6 1-6 10-18 1-18	1.20-1.50 1.40-1.70 1.55-1.70 1.55-1.70	6.0-20 6.0-20 0.6-2.0 0.6-6.0	0.08-0.12 0.03-0.07 0.10-0.15 0.03-0.10	5.1-7.3 5.1-7.3 6.6-8.4 7.4-8.4	Low----- Low----- Low----- Low-----	0.10 0.20 0.24 0.24	5	2	2-8

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodi- bility group	Organic matter
								K	T		
	In	Pct	G/cc	In/hr	In/in	pH					Pct
16----- Valkaria	0-5	1-3	1.35-1.50	6.0-20	0.05-0.10	4.5-7.3	Low-----	0.10	5	2	1-4
	5-16	0-2	1.45-1.60	6.0-20	0.03-0.08	4.5-7.3	Low-----	0.10			
	16-51	2-5	1.45-1.60	6.0-20	0.05-0.10	4.5-7.3	Low-----	0.10			
	51-80	1-5	1.45-1.60	6.0-20	0.03-0.08	5.1-8.4	Low-----	0.10			
17----- Malabar	0-4	0-4	1.35-1.55	6.0-20	0.03-0.08	5.1-8.4	Low-----	0.10	5	2	1-2
	4-14	1-5	1.35-1.70	6.0-20	0.05-0.10	5.1-8.4	Low-----	0.10			
	14-48	1-5	1.40-1.70	6.0-20	0.02-0.05	5.1-8.4	Low-----	0.10			
	48-80	12-25	1.55-1.75	<0.2	0.10-0.15	5.1-8.4	Low-----	0.24			
18----- Kaliga	0-39	---	0.15-0.35	6.0-20	0.20-0.25	3.6-4.4	Low-----	0.10	2	2	50-97
	39-45	8-27	1.50-1.65	0.6-6.0	0.10-0.15	4.5-7.3	Moderate----	0.24			
	45-68	30-70	1.60-1.65	<0.2	0.10-0.20	4.5-7.3	High-----	0.32			
	68-80	8-20	1.50-1.65	2.0-20	0.10-0.15	4.5-7.3	Low-----	0.20			
19----- Hicoria	0-4	2-8	0.80-1.25	6.0-20	0.15-0.30	3.6-6.5	Low-----	0.10	5	2	10-20
	4-21	1-7	1.65-1.80	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10			
	21-52	13-30	1.65-1.80	0.06-0.6	0.10-0.20	3.6-7.3	Low-----	0.24			
	52-80	2-30	1.65-1.80	0.06-0.6	0.10-0.20	3.6-7.3	Low-----	0.24			
20----- Samsula	0-36	---	0.25-0.50	6.0-20	0.20-0.25	3.6-4.4	Low-----	---	2	2	>20
	36-65	1-14	1.35-1.55	6.0-20	0.02-0.05	3.6-5.5	Low-----	0.17			
21----- Hontoon	0-65	---	0.20-0.40	6.0-20	0.30-0.50	3.6-4.4	Low-----	---	---	2	75-85
	65-80	1-5	1.30-1.55	6.0-20	0.15-0.20	4.5-5.5	Low-----	0.10			
22----- Brighton	0-12	---	0.15-0.35	6.0-20	0.20-0.50	3.6-4.4	Low-----	0.10	2	2	60-90
	12-80	---	0.15-0.35	6.0-20	0.20-0.40	3.6-4.4	Low-----	---	---		
23----- Gator	0-18	0-1	0.10-0.30	6.0-20	0.30-0.40	4.5-6.0	Low-----	---	---	2	55-85
	18-36	1-2	1.20-1.55	2.0-6.0	0.03-0.05	4.5-6.5	Low-----	0.17			
	36-55	13-20	1.60-1.70	<0.2	0.10-0.15	6.1-8.4	Low-----	0.32			
	55-80	2-4	1.20-1.55	2.0-6.0	0.03-0.05	6.1-8.4	Low-----	0.17			
24----- Pineda	0-4	1-6	1.25-1.60	6.0-20	0.05-0.10	4.5-7.3	Low-----	0.10	5	2	.5-6
	4-30	1-8	1.40-1.70	6.0-20	0.02-0.05	4.5-7.3	Low-----	0.10			
	30-56	10-25	1.50-1.70	<0.2	0.10-0.15	5.1-8.4	Low-----	0.24			
	56-80	3-12	1.45-1.60	2.0-6.0	0.02-0.05	5.6-8.4	Low-----	0.10			
25----- Chobee	0-18	10-20	1.15-1.30	2.0-6.0	0.15-0.20	5.1-7.3	Low-----	0.15	5	3	2-10
	18-57	10-30	1.40-1.65	<0.2	0.12-0.17	6.6-8.4	Low-----	0.15			
	57-80	7-20	1.60-1.75	0.2-6.0	0.06-0.10	7.4-8.4	Low-----	0.20			
26----- Tequesta	0-12	---	0.20-0.40	6.0-20	0.20-0.25	5.1-7.3	Low-----	---	---	2	35-60
	12-32	1-6	1.45-1.65	6.0-20	0.05-0.10	5.1-7.3	Low-----	0.10			
	32-77	15-25	1.50-1.70	0.2-0.6	0.10-0.15	6.1-8.4	Low-----	0.24			
	77-80	5-12	1.40-1.65	6.0-20	0.02-0.05	6.1-8.4	Low-----	0.10			
28----- Archbold	0-4	0-1	1.50-1.60	>20	0.03-0.05	3.6-6.5	Low-----	0.10	5	1	.5-1
	4-80	0-1	1.50-1.60	>20	0.02-0.03	3.6-6.5	Low-----	0.10			
29----- Pomona	0-6	1-6	1.20-1.50	6.0->20	0.05-0.10	3.6-5.5	Low-----	0.10	5	2	1-2
	6-29	0-6	1.45-1.70	6.0-20	0.03-0.08	3.6-5.5	Low-----	0.10			
	29-51	2-7	1.30-1.60	0.6-20.0	0.10-0.20	3.6-5.5	Low-----	0.15			
	51-61	1-6	1.40-1.65	2.0-20	0.03-0.15	3.6-5.5	Low-----	0.10			
	61-80	13-36	1.50-1.80	<0.2	0.10-0.17	3.6-5.5	Low-----	0.20			
30----- Oldsmar	0-32	0-2	1.48-1.61	6.0-20	0.02-0.05	3.6-7.3	Very low----	0.10	5	2	1-2
	32-54	2-8	1.42-1.59	0.2-6.0	0.10-0.15	3.6-7.3	Low-----	0.15			
	54-60	15-30	1.60-1.69	<0.2	0.10-0.15	6.1-8.4	Low-----	0.24			

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH		K	T		Pct
31----- Felda	0-5 5-31 31-70 70-80	1-3 1-3 13-30 1-10	1.30-1.55 1.45-1.55 1.50-1.60 1.50-1.65	6.0-20 6.0-20 0.6-6.0 6.0-20	0.05-0.10 0.02-0.05 0.10-0.15 0.02-0.05	5.1-7.8 5.1-7.8 6.1-7.8 6.1-8.4	Low----- Low----- Low----- Low-----	0.10 0.10 0.24 0.17	4	2	1-4
32----- Arents	0-80	1-25	1.25-1.60	6.0-20	0.02-0.10	6.1-8.4	Low-----	0.10	3	2	<1
33: Basinger-----	0-6 6-21 21-52 52-80	0-4 0-4 1-6 1-3	1.40-1.55 1.40-1.55 1.40-1.65 1.50-1.70	6.0-20 6.0-20 6.0-20 6.0-20	0.03-0.07 0.05-0.10 0.10-0.15 0.05-0.10	3.6-8.4 3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low----- Low-----	0.10 0.10 0.10 0.10	5	2	.5-2
St. Johns-----	0-11 11-26 26-49 49-70 70-80	1-4 1-3 2-6 1-4 2-6	1.30-1.50 1.50-1.70 1.50-1.58 1.50-1.65 1.50-1.58	6.0-20 6.0-20 0.2-2.0 6.0-20 0.2-2.0	0.10-0.15 0.03-0.08 0.10-0.30 0.03-0.08 0.10-0.30	3.6-5.5 3.6-5.5 3.6-5.5 3.6-5.5 3.6-5.5	Low----- Low----- Low----- Low----- Low-----	0.10 0.10 0.15 0.10 0.10	5	2	2-4
Placid-----	0-14 14-80	1-10 1-10	1.70-1.40 1.30-1.60	6.0-20 6.0-20	0.15-0.20 0.05-0.08	3.6-5.5 3.6-6.5	Low----- Low-----	0.10 0.10	5	2	2-10
34: Tavares-----	0-6 6-80	0-4 0-4	1.25-1.60 1.40-1.70	>6.0 >6.0	0.05-0.10 0.02-0.05	3.6-6.0 3.6-6.0	Low----- Low-----	0.10 0.10	5	2	.5-2
Basinger-----	0-6 6-21 21-52 52-80	0-4 0-4 1-6 1-3	1.40-1.55 1.40-1.55 1.40-1.65 1.50-1.70	6.0-20 6.0-20 6.0-20 6.0-20	0.03-0.07 0.05-0.10 0.10-0.15 0.05-0.10	3.6-8.4 3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low----- Low-----	0.10 0.10 0.10 0.10	5	2	.5-2
Sanibel-----	0-8 8-15 15-80	--- 2-6 2-6	0.30-0.55 1.40-1.60 1.50-1.65	6.0-20 6.0-20 6.0-20	0.20-0.50 0.10-0.15 0.03-0.10	3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low-----	0.10 0.10 0.10	4	2	20-50
35----- Sanibel	0-8 8-15 15-80	--- 2-6 2-6	0.30-0.55 1.40-1.60 1.50-1.65	6.0-20 6.0-20 6.0-20	0.20-0.50 0.10-0.15 0.03-0.10	3.6-7.3 3.6-7.3 3.6-7.3	Low----- Low----- Low-----	0.10 0.10 0.10	4	2	20-50
36----- Pomello	0-56 56-62 62-80	0-2 0-2 0-2	1.35-1.65 1.45-1.60 1.35-1.65	>20 2.0-6.0 6.0-20	0.02-0.05 0.10-0.30 0.02-0.05	4.5-6.0 4.5-6.0 4.5-6.0	Low----- Low----- Low-----	0.10 0.15 0.10	5	1	<1
37----- Malabar	0-18 18-48 48-59 59-72	0-4 1-5 12-25 1-8	1.20-1.55 1.35-1.70 1.55-1.75 1.40-1.70	6.0-20 6.0-20 <0.2 6.0-20	0.03-0.08 0.05-0.10 0.10-0.15 0.03-0.08	5.1-8.4 5.1-8.4 5.1-8.4 5.1-8.4	Low----- Low----- Low----- Low-----	0.10 0.10 0.24 0.15	5	2	1-2
38----- EauGallie	0-26 26-40 40-80	0-5 1-8 13-31	1.25-1.50 1.45-1.60 1.55-1.70	6.0-20 0.6-6.0 0.06-2.0	0.02-0.07 0.15-0.25 0.10-0.20	4.5-6.0 4.5-6.5 4.5-7.8	Low----- Low----- Low-----	0.10 0.15 0.20	5	2	2-8
39----- Smyrna	0-15 15-22 22-80	1-6 3-8 1-6	1.25-1.45 1.35-1.45 1.50-1.75	6.0-20 0.6-6.0 6.0-20	0.03-0.07 0.10-0.20 0.03-0.07	3.6-6.0 3.6-6.0 3.6-6.0	Low----- Low----- Low-----	0.10 0.15 0.10	5	2	1-5
40----- Arents	0-12 12-38 38-52	1-10 1-10 ---	1.35-1.55 1.35-1.55 0.20-0.40	6.0-20 6.0-20 6.0-20	0.02-0.10 0.02-0.10 0.30-0.50	6.6-8.4 5.6-7.3 5.1-7.3	Low----- Low----- Low-----	0.10 0.10 ---	5	2	---

TABLE 14.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Wind erodi- bility group	Organic matter
								K	T		
	In	Pct	G/cc	In/hr	In/in	pH					Pct
41:											
Anclote-----	0-20	2-8	1.30-1.45	6.0-20	0.10-0.15	5.6-8.4	Low-----	0.10	5	2	2-10
	20-80	2-8	1.50-1.65	6.0-20	0.03-0.10	5.6-8.4	Low-----	0.10			
Basinger-----	0-6	0-4	1.40-1.55	6.0-20	0.03-0.07	3.6-7.3	Low-----	0.10	5	2	.2-1
	6-21	0-4	1.40-1.55	6.0-20	0.03-0.07	3.6-7.3	Low-----	0.10			
	21-52	1-6	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	Low-----	0.10			
	52-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10			
42:											
Astatula-----	0-7	1-3	1.25-1.60	>20	0.04-0.10	4.5-6.5	Low-----	0.10	5	2	.5-2
	7-80	1-3	1.45-1.60	>20	0.02-0.05	4.5-6.5	Low-----	0.10			
Urban land.											
Urban land											
44:											
Satellite-----	0-3	1-3	1.10-1.45	>20	0.02-0.10	4.5-7.8	Low-----	0.10	5	2	.5-2
	3-80	0-2	1.35-1.55	>20	0.02-0.05	4.5-7.8	Low-----	0.10			
Basinger-----	0-6	0-4	1.40-1.55	6.0-20	0.03-0.07	3.6-8.4	Low-----	0.10	5	2	.5-2
	6-21	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10			
	21-52	1-6	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	Low-----	0.10			
Urban land.	52-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10			
45:											
Paola-----	0-5	0-2	1.20-1.45	>20	0.02-0.05	3.6-7.3	Low-----	0.10	5	1	<.5
	5-17	0-2	1.45-1.60	>20	0.02-0.05	3.6-7.3	Low-----	0.10			
	17-80	0-3	1.45-1.60	>20	0.02-0.05	3.6-7.3	Low-----	0.10			
Basinger-----	0-6	0-4	1.40-1.55	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10	5	2	1-8
	6-21	0-4	1.40-1.60	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10			
	21-52	1-3	1.40-1.65	6.0-20	0.10-0.15	3.6-7.3	Low-----	0.10			
	52-80	1-3	1.50-1.70	6.0-20	0.05-0.10	3.6-7.3	Low-----	0.10			
46-----	0-39	---	0.15-0.35	6.0-20.0	0.20-0.25	3.6-4.4	Low-----	---	2	2	50-97

TABLE 15.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Dura- tion	Months	Depth <u>Ft</u>	Kind	Months	Initial <u>In</u>	Total <u>In</u>	Uncoated steel	Concrete
1----- Paola	A	None-----	---	---	>6.0	---	---	---	---	Low-----	High.
2----- St. Lucie	A	None-----	---	---	>6.0	---	---	---	---	Low-----	Moderate.
3*----- Basinger	D	None-----	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Moderate.
4----- Duette	A	None-----	---	---	4.0-6.0	Apparent	Jun-Oct	---	---	Low-----	High.
5----- Daytona	B	None-----	---	---	3.5-5.0	Apparent	Jul-Nov	---	---	Moderate	High.
6----- Tavares	A	None-----	---	---	3.5-6.0	Apparent	Jun-Dec	---	---	Low-----	High.
7*----- Placid	D	None-----	---	---	+2-0	Apparent	Jun-Mar	---	---	High-----	High.
8----- Immokalee	B/D	None-----	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	High.
9----- Astatula	A	None-----	---	---	>6.0	---	---	---	---	Low-----	High.
10----- Myakka	B/D	None-----	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	High.
11----- Orsino	A	None-----	---	---	3.5-5.0	Apparent	Jun-Dec	---	---	Low-----	Moderate.
12----- Basinger	B/D	None-----	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
13----- Felda	B/D	None-----	---	---	0-1.0	Apparent	Jul-Mar	---	---	High-----	Moderate.
14----- Satellite	C	None-----	---	---	1.0-3.5	Apparent	Jun-Nov	---	---	Low-----	Moderate.
15----- Bradenton	B/D	None-----	---	---	0-1.0	Apparent	Jun-Dec	---	---	High-----	Low.
16----- Valkaria	B/D	None-----	---	---	0-1.0	Apparent	Jun-Sep	---	---	High-----	Moderate.
17----- Malabar	B/D	None-----	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
18*----- Kaliga	B/D	None-----	---	---	+2-0	Apparent	Jun-Apr	16-20	24-45	High-----	High.

See footnote at end of table.

TABLE 15.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>	<u>In</u>		
19*----- Hicoria	D	None-----	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
20*----- Samsula	B/D	None-----	---	---	+2-0	Apparent	Jan-Dec	16-20	30-36	High-----	High.
21*----- Hontoon	B/D	None-----	---	---	+2-0	Apparent	Jan-Dec	16-24	>52	High-----	High.
22*----- Brighton	B/D	None-----	---	---	+1-0	Apparent	Jan-Dec	16-20	50-60	High-----	High.
23*----- Gator	B/D	None-----	---	---	+2-0	Apparent	Jun-Dec	6-14	20-23	High-----	High.
24----- Pineda	B/D	None-----	---	---	0-1.0	Apparent	Jun-Nov	---	---	High-----	Low.
25*----- Chobee	D	None-----	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
26*----- Tequesta	B/D	None-----	---	---	+2-0	Apparent	Jan-Dec	3-6	8-12	High-----	Low.
28----- Archbold	A	None-----	---	---	3.5-6.0	Apparent	Jun-Nov	---	---	Low-----	Moderate.
29----- Pomona	B/D	None-----	---	---	0-1.0	Apparent	Jul-Sep	---	---	High-----	High.
30----- Oldsmar	B/D	None-----	---	---	0-1.0	Apparent	Jun-Feb	---	---	Moderate	High.
31*----- Felda	D	None-----	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	High.
32----- Arents	A	None-----	---	---	>6.0	---	---	---	---	Low-----	Low.
33: Basinger-----	B/D	None-----	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
St. Johns-----	B/D	None-----	---	---	0-1.0	Apparent	Jun-Apr	---	---	High-----	High.
Placid-----	B/D	None-----	---	---	0-1.0	Apparent	Jun-Apr	---	---	High-----	High.
34: Tavares-----	A	None-----	---	---	3.5-6.0	Apparent	Jun-Dec	---	---	Low-----	High.
Basinger-----	B/D	None-----	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
Sanibel*-----	B/D	None-----	---	---	+1-0	Apparent	Jun-Feb	3-5	5-15	High-----	Low.
35*----- Sanibel	B/D	None-----	---	---	+1-0	Apparent	Jun-Feb	3-5	5-15	High-----	Low.
36----- Pomello	C	None-----	---	---	2.0-3.5	Apparent	Jul-Nov	---	---	Low-----	High.

See footnote at end of table.



TABLE 15.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>	<u>In</u>		
37*----- Malabar	D	None-----	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Low.
38----- Eau Gallie	B/D	None-----	---	---	0-1.0	Apparent	Jun-Oct	---	---	High-----	Moderate.
39----- Smyrna	B/D	None-----	---	---	0-1.0	Apparent	Jul-Oct	---	---	High-----	High.
40----- Arents	B	None-----	---	---	2.0-3.0	Apparent	Jun-Nov	---	---	High-----	High.
41: Anclote-----	D	Frequent---	Long---	Jun-Nov	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
Basinger-----	D	Frequent---	Long---	Jul-Sep	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
42: Astatula-----	A	None-----	---	---	>6.0	---	---	---	---	Low-----	High.
Urban land.											
43----- Urban land	-	None-----	---	---	>2.0	---	---	---	---	---	---
44: Satellite-----	C	None-----	---	---	1.0-3.5	Apparent	Jun-Nov	---	---	Low-----	Moderate.
Basinger-----	B/D	None-----	---	---	0-1.0	Apparent	Jun-Feb	---	---	High-----	Moderate.
Urban land----	-	None-----	---	---	>2.0	---	---	---	---	---	---
45: Paola-----	A	None-----	---	---	>6.0	---	---	---	---	Low-----	High.
Basinger*-----	D	None-----	---	---	+2-0	Apparent	Jun-Feb	---	---	High-----	Moderate.
46----- Kaliga	D	Frequent---	Very long.	Jun-Nov	0-1.0	Apparent	Jun-Feb	6-10	21	High-----	High.

\* In the "High water table--Depth" column, a plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

TABLE 16.--DEPTH TO WATER TABLE IN SELECTED SOILS

[Monthly readings were based on the average of two readings taken on the 1st and 15th of each month. Absence of an entry indicates that reading was not taken for that month. Measurements are in inches below soil surface. The symbol > means more than]

Soil	Year	Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Archbold		-----Inches-----											
	1982	--	--	--	--	--	--	--	55	50	49	57	60
	1983	62	59	46	65	66	72	69	60	54	55	67	69
	1984	72	75	76	>80	>80	>80	75	54	52	53	65	70
	1985	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80	>80
	1986	>80	>80	>80	>80	>80	>80	>80	78	75	>80	>80	>80
Basinger	1982	--	--	--	66	39	27	21	12	10	10	21	27
	1983	32	15	9	15	23	21	17	14	11	19	29	36
	1984	40	45	45	40	42	34	34	20	12	13	27	39
	1985	44	47	51	58	63	59	57	60	56	57	56	62
	1986	63	65	65	66	65	60	51	47	42	45	48	50
Pomello	1984	--	--	--	--	--	60	48	30	24	27	30	48
	1985	59	68	72	77	77	73	64	57	38	56	56	60
	1986	66	72	71	75	69	66	59	59	42	37	52	59
Satellite	1982	--	--	--	78	63	48	51	35	32	31	34	40
	1983	45	40	29	38	50	48	48	39	29	35	45	51
	1984	57	70	58	50	47	45	55	30	31	33	48	54
	1985	56	62	72	76	78	68	66	64	59	59	60	61
	1986	69	74	76	72	60	56	60	40	38	43	52	57

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[illegible]

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Age Group	Gender	Vaccinated (%)
18-24	Male	~10
18-24	Female	~10
25-34	Male	~15
25-34	Female	~15
35-44	Male	~25
35-44	Female	~25
45-54	Male	~40
45-54	Female	~40
55-64	Male	~60
55-64	Female	~60
65-74	Male	~80
65-74	Female	~80
75-84	Male	~90
75-84	Female	~90
85+	Male	~95
85+	Female	~95



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## S OF SELECTED SOILS--Continued

nd	e distribution				Hy- draulic conduc- tivity *	Bulk density * (field moist)	Water content *		
	Very fine (0.1- 0.05 mm)	Total (2- 0.05 mm)	Silt (0.05- 0.002 mm)	Clay (<0.002 mm)			1/10 bar	1/3 bar	15 bar
	Pct				Cm/hr	G/cm	Pct (wt)		
3	0.8	98.5	0.4	1.1	88.6	1.23	9.8	7.3	2.8
3	0.6	99.5	0.0	0.5	68.3	1.55	2.8	2.1	0.5
5	0.8	99.5	0.0	0.5	103.0	1.58	1.8	1.2	0.3
0	0.7	97.3	0.1	2.6	75.6	1.44	7.7	6.1	1.4
5	1.0	98.2	0.2	1.6	105.3	1.51	3.3	2.4	0.5
9	9.0	98.1	1.1	0.8	21.0	1.53	8.7	6.2	1.5
4	9.4	97.9	1.7	0.4	17.7	1.58	3.9	2.3	0.4
4	10.8	98.1	1.5	0.4	16.8	1.60	3.0	2.3	0.3
9	9.0	87.6	8.7	3.7	0.2	1.79	15.8	13.4	2.2
4	10.0	91.0	5.3	3.7	0.2	1.63	20.4	16.3	2.2
1	7.9	72.2	2.6	22.2	2.4	1.66	20.4	19.4	9.2
7	9.4	77.7	2.8	19.5	3.7	1.77	17.2	15.9	6.5
4	25.3	97.6	1.3	1.1	25.3	1.29	17.2	10.8	3.2
3	34.4	98.1	1.6	0.3	13.5	1.55	6.5	2.8	1.2
4	35.3	97.4	2.0	0.6	12.3	1.59	6.6	2.2	0.7
1	31.7	91.1	3.7	5.2	0.6	1.64	18.9	14.5	2.2
2	34.4	78.6	5.9	15.2	0.3	1.52	26.4	24.5	7.6
0	40.0	90.8	4.6	4.6	2.3	1.66	15.3	8.2	1.8
1	30.0	94.7	2.2	3.1	3.0	1.66	15.5	7.9	1.4
5	27.4	91.4	3.0	5.6	7.7	1.66	12.5	5.9	0.9
-	---	---	---	---	106.0	0.81	71.1	59.9	12.4
1	25.9	91.4	5.5	3.1	27.6	1.08	31.9	23.1	4.8
0	26.1	98.2	1.0	0.8	13.4	1.64	4.8	2.2	0.7
0	26.0	83.0	3.7	13.3	0.6	1.73	16.3	14.4	3.4
6	26.4	80.4	4.5	15.1	7.8	1.72	19.2	18.2	6.1
4	16.6	81.0	3.5	15.5	1.1	1.76	17.8	16.7	6.5
3	11.2	97.3	1.8	0.9	42.1	1.39	10.8	8.1	2.6
6	12.3	97.9	1.3	0.8	29.6	1.54	3.8	2.4	0.8
5	16.1	97.7	1.9	0.4	25.0	1.60	3.2	1.8	1.0
6	12.6	94.3	4.8	0.9	11.8	1.51	19.8	15.7	2.3
5	10.4	94.9	2.3	2.8	9.9	1.57	14.2	9.4	2.0

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil series and sample number	Depth	Horizon	Particle-size distribution								Hy- draulic conduc- tivity *	Bulk density * (field moist)	Water content *		
			Sand										1/10 bar	1/3 bar	15 bar
			Very coarse (2.1 mm)	Coarse (1-0.5 mm)	Medium (0.5- 0.25 mm)	Fine (0.25- 0.1 mm)	Very fine (0.1- 0.05 mm)	Total (2- 0.05 mm)	Silt (0.05- 0.002 mm)	Clay ( $<0.002$ mm)					
	<u>Cm</u>		<u>Pct</u>								<u>Cm/hr</u>	<u>G/cm</u>	<u>Pct (wt)</u>		
Malabar fine sand:															
S84FL-55-11-1	0-10	Ap	0.0	2.0	17.3	54.2	23.6	97.1	0.9	2.0	30.6	1.23	13.0	9.0	3.3
-2	10-36	E	0.3	3.3	14.8	53.9	26.3	98.6	0.8	0.6	21.4	1.55	7.8	4.5	1.5
-3	36-76	Bw1	0.2	3.2	12.8	52.4	27.9	96.5	3.0	0.5	16.0	1.59	9.1	6.1	0.5
-4	76-94	Bw2	0.2	2.9	10.9	50.3	28.5	92.8	3.5	3.7	1.7	1.61	15.2	10.0	1.4
-5	94-112	Bw3	0.4	3.7	12.3	48.9	26.2	91.5	4.8	3.7	7.1	1.64	12.5	9.0	2.1
-6	112-122	Bw4	0.6	4.1	11.7	52.5	25.7	94.6	3.0	2.4	2.6	1.62	11.8	7.1	1.1
-7	122-165	Btg	0.4	4.0	12.4	43.2	23.6	83.6	4.1	12.3	0.7	1.74	15.3	12.5	4.0
-8	165-203	Btg	0.6	4.2	12.8	41.2	18.6	77.4	4.0	18.6	0.0	1.80	15.7	13.8	6.3
Orsino sand:															
S82FL-55-05-1	0-5	A	0.0	5.8	65.0	28.1	0.6	99.5	0.0	0.5	68.4	1.36	5.2	3.8	2.1
-2	5-61	E	0.0	5.5	63.9	29.6	0.5	99.5	0.0	0.5	98.8	1.55	2.6	2.0	0.5
-3	61-117	E	0.0	5.5	62.3	31.1	0.6	99.5	0.0	0.5	78.8	1.59	2.7	2.1	0.4
-4	117-168	Bw/Bh	0.0	4.7	58.3	34.2	0.5	97.7	0.0	2.3	164.5	1.48	3.3	2.5	0.7
-5	168-203	C	0.0	2.7	53.0	42.3	0.6	98.6	0.3	1.1	91.4	1.48	3.8	2.8	0.6
Paola sand:															
S82FL-55-06-1	0-13	Ap	0.0	7.0	63.0	29.4	0.5	99.0	0.0	0.1	68.3	1.41	4.8	3.2	1.1
-2	13-43	E	0.0	6.7	60.4	31.4	0.6	99.1	0.8	0.1	99.3	1.45	3.7	2.6	0.4
-3	43-68	Bw	0.0	6.6	63.2	28.7	0.4	98.9	0.7	0.4	94.0	1.49	3.7	2.8	0.3
-4	68-107	C1	0.0	6.5	60.5	30.9	0.3	98.2	0.9	0.9	115.5	1.46	3.3	2.3	0.6
-5	107-155	C2	0.0	5.8	58.4	33.5	0.5	98.2	0.7	1.1	103.3	1.51	3.4	2.4	0.8
-6	155-203	C2	0.0	5.3	56.4	36.3	0.4	98.4	0.0	1.6	79.5	1.48	2.6	1.6	0.5
Placid fine sand:															
S85FL-55-23-1	0-8	A	---	---	---	---	---	---	---	---	50.0	0.69	85.5	75.8	20.8
-2	8-28	A	0.0	1.7	33.0	51.9	10.6	97.2	1.5	1.3	11.8	1.56	15.9	10.4	2.2
-3	28-96	Cg1	0.0	1.7	29.9	53.8	13.0	98.4	1.2	0.4	20.1	1.67	6.6	4.0	0.6
-4	96-124	Cg2	0.0	1.8	28.3	51.6	11.6	93.3	2.3	4.4	3.7	1.75	12.9	7.9	1.7
-5	124-145	Cg3	0.0	1.8	27.9	52.6	11.1	93.4	2.3	4.3	7.6	1.74	8.7	5.8	1.4
-6	145-203	Cg4	0.0	1.8	26.9	53.6	11.4	93.7	2.0	4.3	9.9	1.70	9.0	5.5	1.7
Pomello sand:															
S85FL-55-22-1	0-10	A	0.0	3.3	64.0	29.4	1.8	98.5	1.1	0.4	61.8	1.57	3.3	2.7	0.8
-2	10-76	E	0.0	2.6	54.9	37.7	3.7	98.9	0.3	0.8	55.2	1.62	2.6	2.3	0.3
-3	76-142	E	0.0	2.5	54.0	38.6	3.4	98.5	1.1	0.4	57.9	1.61	2.5	2.1	0.2
-4	142-157	Bh	0.0	2.7	49.6	37.2	2.7	92.2	3.8	4.0	10.8	1.62	11.1	8.6	2.0
-5	157-203	BC	0.0	2.9	52.2	40.6	1.8	97.5	1.4	1.1	49.6	1.59	5.1	3.6	0.8

See footnote at end of table.

TABLE 17.--PHYSICAL ANALYSES OF SELECTED SOILS--Continued

Soil series and sample number	Depth	Horizon	Particle-size distribution								Hy-draulic conduc-tivity *	Bulk density * (field moist)	Water content *		
			Sand					Silt (0.05-0.002 mm)	Clay (<0.002 mm)	1/10 bar			1/3 bar	15 bar	
			Very coarse (2.1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)								Total (2-0.05 mm)
	Cm						Pct				Cm/hr	G/cm	Pct (wt)		
St. Lucie sand:															
S82FL-55-07-1	0-15	A	0.0	16.1	73.1	9.9	0.4	99.5	0.1	0.4	131.4	1.40	4.0	3.0	1.5
-2	15-79	C	0.0	14.0	70.7	13.9	0.9	99.5	0.0	0.5	129.5	1.54	2.3	1.6	0.4
-3	79-142	C	0.0	11.8	69.4	17.2	1.1	99.5	0.0	0.5	103.6	1.58	4.3	2.9	0.5
-4	142-203	C	0.0	9.7	67.8	21.2	1.0	99.7	0.0	0.3	112.5	1.53	2.5	1.8	0.3
Satellite sand:															
S85FL-55-21-1	0-10	A	0.0	1.7	44.4	49.4	2.5	98.0	1.5	0.5	57.9	1.53	4.3	3.5	1.3
-2	10-66	C1	0.0	2.5	40.1	52.8	3.4	98.8	1.0	0.2	53.2	1.65	2.9	2.5	0.4
-3	66-127	C2	0.0	2.6	38.8	53.5	3.8	98.7	1.1	0.2	53.9	1.66	2.2	2.0	0.4
-4	127-203	C2	0.0	2.9	37.2	55.7	2.9	98.7	0.9	0.4	47.3	1.54	2.2	1.8	0.2
Smyrna sand:															
S84FL-55-15-1	0-13	Ap	0.1	4.2	21.8	42.8	27.4	96.3	2.4	1.3	18.4	1.23	26.0	19.7	6.2
-2	13-38	E	0.3	4.0	19.1	44.7	29.0	97.1	2.3	0.6	14.8	1.51	5.9	2.7	0.7
-3	38-46	Bh1	0.3	4.4	18.7	42.1	26.1	91.6	4.3	4.1	11.2	1.44	21.1	17.4	3.5
-4	46-56	Bh2	0.3	4.1	17.5	44.0	26.0	91.9	3.6	4.5	34.2	1.45	13.4	9.5	2.6
-5	56-89	BC	0.3	3.9	16.2	45.3	29.7	95.4	2.7	1.9	18.4	1.60	8.4	4.2	0.8
-6	89-114	C1	0.4	4.7	17.4	43.0	29.4	94.9	2.6	2.5	10.6	1.71	6.4	2.9	0.7
-7	114-142	C2	0.4	4.9	16.6	40.0	28.5	93.0	1.0	6.0	7.6	1.69	12.9	7.9	2.0
-8	142-203	C3	0.6	5.7	19.4	42.1	27.1	94.9	1.6	3.5	1.3	1.80	7.1	4.5	1.3
Tavares sand:															
S82FL-55-02-1	0-15	A	0.0	9.3	56.3	29.4	2.6	97.6	0.6	1.8	63.7	1.45	5.1	3.7	1.1
-2	15-91	C1	0.0	10.2	59.5	26.7	1.5	97.9	0.9	1.2	85.4	1.57	3.7	2.8	0.6
-3	91-117	C2	0.0	9.6	55.9	29.6	2.6	97.7	1.0	1.3	80.8	1.60	2.6	1.8	0.6
-4	117-142	C3	0.1	10.9	58.4	26.8	1.8	98.0	0.8	1.2	97.8	1.60	2.5	1.6	0.5
-5	142-203	C4	0.2	9.1	54.2	32.6	2.5	98.6	0.8	0.6	84.1	1.62	2.2	1.5	0.3
Valkaria fine sand:															
S84FL-55-09-1	0-13	Ap	0.0	0.1	3.8	62.0	31.1	97.0	2.2	0.8	18.2	1.42	14.4	7.3	2.4
-2	13-28	E1	0.0	0.2	4.0	63.3	30.6	98.1	1.3	0.6	10.3	1.57	7.6	3.5	1.2
-3	28-41	E2	0.0	0.2	3.9	62.4	31.3	97.8	1.1	1.1	14.5	1.59	5.9	2.4	0.5
-4	41-84	Bw1	0.0	0.2	3.8	59.7	32.2	95.9	2.0	2.1	27.1	1.51	6.9	2.8	0.3
-5	84-130	Bw2	0.0	0.2	3.7	63.3	29.7	96.9	2.1	1.0	13.8	1.57	8.7	3.9	0.3
-6	130-203	C	0.0	0.3	4.6	65.8	26.7	97.4	1.7	0.9	6.1	1.62	5.4	2.3	0.6

\* Some of this data is slightly outside of the properties given in table 14. The original concept has not been changed at this time because of the small amount of data available.

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Extractable bases					Ex-trac-table acidity	Sum of cat-ions	Base satu-ration	Or-ganic car-bon *	Electri-cal conduc-tivity	pH **			Pyrophosphate extractable			Citrate-dithio-nite extracta-ble		
			Ca	Mg	Na	K	Sum						H <sub>2</sub> O (1:1)	CaCl <sub>2</sub> 0.1m (1:2)	KCl in (1:1)	C	Fe	Al	Fe	Al	
--Milliequivalents/100 grams of soil--											Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
<b>Archbold sand:</b>																					
S82FL-55-08-1	0-8	A	0.06	0.02	0.01	0.00	0.09	0.68	0.77	12	0.27	0.01	5.3	4.0	3.6	---	---	---	---	---	
-2	8-86	C	0.02	0.01	0.01	0.00	0.04	0.18	0.22	18	0.05	0.01	5.7	5.1	4.6	---	---	---	---	---	
-3	86-145	C	0.03	0.02	0.01	0.00	0.06	0.09	0.15	40	0.05	0.01	5.8	5.2	4.4	---	---	---	---	---	
-4	145-203	C	0.01	0.00	0.01	0.00	0.02	0.13	0.15	13	0.02	0.01	5.9	5.5	4.9	---	---	---	---	---	
<b>Astatula sand:</b>																					
S81FL-55-01-1	0-20	Ap	1.22	0.30	0.01	0.04	1.57	0.90	2.47	64	0.29	0.03	4.9	5.0	4.9	---	---	---	---	---	
-2	20-84	C	0.30	0.16	0.01	0.02	0.49	0.75	1.24	40	0.08	0.02	5.1	5.1	5.3	---	---	---	---	---	
-3	84-147	C	0.20	0.13	0.02	0.02	0.37	0.82	1.19	31	0.07	0.02	5.0	5.1	5.3	---	---	---	---	---	
-4	147-203	C	0.06	0.05	0.02	0.02	0.15	1.27	1.42	11	0.08	0.02	4.8	4.8	4.5	---	---	---	---	---	
<b>Basinger fine sand:</b>																					
S85FL-55-17-1	0-15	Ap	0.63	0.07	0.02	0.01	0.73	1.25	1.98	37	0.38	0.03	5.9	4.6	4.7	---	---	---	---	---	
-2	15-41	E1	0.20	0.02	0.01	0.00	0.23	0.55	0.78	29	0.14	0.00	6.1	5.2	5.1	---	---	---	---	---	
-3	41-53	E2	0.30	0.05	0.02	0.00	0.37	1.67	2.04	18	0.18	0.00	5.9	5.0	4.6	---	---	---	---	---	
-4	53-76	Bh/E	0.25	0.06	0.01	0.01	0.33	2.18	2.51	13	0.11	0.00	5.8	5.1	4.5	---	---	---	---	---	
-5	76-132	Bh/E	0.23	0.12	0.03	0.01	0.39	2.92	3.31	12	0.23	0.00	5.6	4.9	4.3	---	---	---	---	---	
-6	132-157	C1	0.33	0.25	0.10	0.02	0.70	2.08	2.78	25	0.12	0.00	5.2	4.6	4.1	---	---	---	---	---	
-7	157-203	C2	0.47	1.60	0.05	0.04	2.16	3.38	5.54	39	0.02	0.00	4.4	3.9	3.2	---	---	---	---	---	
<b>Bradenton fine sand:</b>																					
S84FL-55-12-1	0-10	Ap	4.26	0.82	0.25	0.18	5.51	4.66	10.17	54	2.12	0.18	5.2	4.8	5.2	---	---	---	---	---	
-2	10-36	C	0.44	0.11	0.12	0.03	0.70	0.67	1.37	51	0.15	0.11	5.2	5.2	5.6	---	---	---	---	---	
-3	36-74	Btg	17.50	3.70	3.42	0.24	24.86	5.22	30.08	83	0.16	0.09	8.0	7.5	7.6	---	---	---	0.21	0.03	
-4	74-112	Btkg	30.56	5.96	0.99	0.04	37.55	3.32	40.87	92	0.09	0.17	8.1	7.6	7.8	---	---	---	0.32	0.03	
-5	112-152	Ckg1	22.06	3.29	0.40	0.04	25.79	2.14	27.93	92	0.07	0.13	8.1	7.5	8.1	---	---	---	---	---	
-6	152-203	Ckg2	29.25	6.07	0.79	0.54	36.65	2.96	39.61	93	0.13	0.18	7.8	7.7	8.0	---	---	---	---	---	
<b>Chobee fine sandy loam:</b>																					
S85FL-55-20-1	0-8	A	10.75	3.13	0.20	0.17	14.25	27.09	41.34	34	7.72	0.00	4.7**	4.4	3.8	---	---	---	---	---	
-2	8-46	A	12.25	3.04	0.12	0.03	15.44	8.84	24.28	64	1.24	0.03	5.3	4.9	4.5	---	---	---	---	---	
-3	46-91	Btg1	16.50	4.11	0.11	0.02	20.74	7.09	27.83	75	0.07	0.04	6.5	5.5	4.9	---	---	---	0.21	0.03	
-4	91-145	Btg2	13.75	2.67	0.11	0.02	16.55	5.46	22.01	75	0.06	0.00	6.6	5.9	5.1	---	---	---	0.16	0.03	
-5	145-203	Cg	6.30	0.90	0.08	0.15	7.43	1.50	8.93	83	0.03	0.00	7.8	6.8	7.5	---	---	---	---	---	

See footnotes at end of table.

# ED SOILS--Continued

Electrical conductivity	pH **			Pyrophosphate extractable			Citrate- dithio- nite extracta- ble	
	H <sub>2</sub> O	CaCl <sub>2</sub>	KCl	C	Fe	Al	Fe	Al
	(1:1)	0.1m (1:2)	in (1:1)					
Mmhos/cm				Pct	Pct	Pct	Pct	Pct
0.03	4.2	3.8	3.6	---	---	---	---	---
0.02	5.3	4.0	3.7	---	---	---	---	---
0.03	4.6	3.9	3.8	0.31	0.01	0.09	0.04	0.03
0.01	4.8	4.3	4.1	---	---	---	---	---
0.01	4.9	4.6	4.4	---	---	---	---	---
0.03	4.4	3.6	3.3	---	---	---	---	---
0.01	4.8	4.1	4.1	---	---	---	---	---
0.01	4.8	4.6	4.5	---	---	---	---	---
0.01	4.4	4.2	3.9	0.38	0.01	0.08	0.00	0.03
0.01	4.5	4.3	4.3	---	---	---	---	---
0.00	4.2**	3.4	2.8	---	---	---	---	---
0.00	4.9	3.9	3.3	---	---	---	---	---
0.00	5.2	4.3	3.8	---	---	---	---	---
0.00	4.6	4.0	3.4	1.06	0.26	0.11	0.15	0.07
0.00	4.8	4.1	3.6	1.24	0.03	0.25	0.07	0.23
0.00	4.8	4.0	3.3	---	---	---	0.08	0.05
0.00	4.6	3.9	3.1	---	---	---	0.12	0.07
0.10	3.8**	3.7	3.9	---	---	---	---	---
0.04	4.6	4.5	3.8	---	---	---	---	---
0.03	5.1	5.1	5.5	---	---	---	---	---
0.06	5.1	5.1	5.2	---	---	---	---	---
0.06	5.7	5.8	5.2	---	---	---	0.28	0.05
0.09	7.6	7.3	7.4	---	---	---	---	---
0.09	7.8	7.5	8.2	---	---	---	---	---
0.12	7.6	7.5	7.9	---	---	---	---	---
0.17	4.2	4.3	4.5	---	---	---	---	---
0.10	3.5	3.9	3.5	---	---	---	---	---
0.06	4.1	4.1	4.3	---	---	---	---	---
0.06	4.0	3.9	3.7	---	---	---	0.18	0.05
0.11	3.7	3.8	3.6	---	---	---	0.22	0.05
0.05	3.5	3.8	3.6	---	---	---	---	---



TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Hori- zon	Extractable bases					Ex- trac- table acid- ity	Sum of cat- ions	Base satu- ra- tion	Or- ganic car- bon *	Electri- cal conduc- tivity	pH **			Pyrophosphate extractable			Citrate- dithio- nite extracta- ble		
			Ca	Mg	Na	K	Sum						H <sub>2</sub> O (1:1)	CaCl <sub>2</sub> 0.1m (1:2)	KCl in (1:1)	C	Fe	Al	Fe	Al	
	Cm		--Milliequivalents/100 grams of soil--							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct	
Immokalee sand:																					
S84FL-55-14-1	0-15	Ap	3.05	0.41	0.07	0.03	3.56	2.88	6.44	55	0.95	0.15	4.9	4.7	5.1	---	---	---	---	---	
-2	15-36	E1	0.54	0.09	0.02	0.00	0.65	0.62	1.27	51	0.14	0.05	5.6	5.4	6.0	---	---	---	---	---	
-3	36-94	E2	0.15	0.03	0.02	0.00	0.20	0.44	0.64	31	0.03	0.04	5.8	6.7	6.3	---	---	---	---	---	
-4	94-152	Bh1	0.46	0.99	0.24	0.35	2.04	23.14	25.18	8	2.20	0.16	3.5	3.3	3.4	2.63	0.01	0.13	0.04	0.15	
-5	152-203	Bh2	0.18	0.61	0.12	0.15	1.06	12.76	13.82	8	1.48	0.13	3.3**	3.3	3.3	1.46	0.01	0.05	0.05	0.06	
Malabar fine sand:																					
S84FL-55-11-1	0-10	Ap	3.94	1.17	0.06	0.03	5.20	2.51	7.71	67	1.26	0.08	6.1	6.0	6.0	---	---	---	---	---	
-2	10-36	E	0.24	0.09	0.12	0.12	0.57	0.29	0.86	66	0.08	0.17	5.9	5.9	6.2	---	---	---	---	---	
-3	36-76	Bw1	0.22	0.14	0.04	0.02	0.42	0.09	0.51	84	0.08	0.04	6.0	6.1	6.4	---	---	---	---	---	
-4	76-94	Bw2	0.99	0.18	0.07	0.03	1.27	1.52	2.79	46	0.14	0.04	5.7	5.5	5.6	---	---	---	---	---	
-5	94-112	Bw3	1.69	0.25	0.13	0.05	2.12	2.58	4.70	45	0.14	0.06	5.8	5.6	5.7	---	---	---	---	---	
-6	112-122	Bw4	0.71	0.13	0.07	0.01	0.92	1.02	1.94	47	0.11	0.04	5.5	5.3	5.4	---	---	---	---	---	
-7	122-165	Btg	3.01	0.74	0.19	0.03	3.97	3.14	7.11	56	0.08	0.15	4.2*	4.5	4.3	---	---	---	0.84	0.09	
-8	165-203	Btg	5.30	1.60	0.21	0.03	7.14	4.23	11.37	63	0.05	0.11	4.3*	4.8	4.4	---	---	---	0.52	0.05	
Orsino sand:																					
S82FL-55-05-1	0-5	A	1.16	0.25	0.04	0.00	1.45	7.27	8.72	17	1.79	0.03	4.5	3.5	3.3	---	---	---	---	---	
-2	5-61	E	0.02	0.01	0.01	0.00	0.04	0.33	0.37	11	0.09	0.02	5.3	4.2	3.9	---	---	---	---	---	
-3	61-117	E	0.02	0.01	0.01	0.00	0.04	0.04	0.08	50	0.03	0.02	5.7	4.8	4.4	---	---	---	---	---	
-4	117-168	Bw/Bh	0.02	0.01	0.01	0.00	0.04	3.14	3.18	1	0.32	0.01	4.9	4.4	4.3	0.20	0.01	0.10	0.01	0.04	
-5	168-203	C	0.02	0.01	0.01	0.00	0.04	1.82	1.86	2	0.19	0.01	5.1	4.8	4.5	---	---	---	---	---	
Paola sand:																					
S82FL-55-06-1	0-13	Ap	0.10	0.06	0.01	0.01	0.18	1.30	1.48	12	0.42	0.01	5.1	4.0	3.7	---	---	---	---	---	
-2	13-43	E	0.21	0.03	0.01	0.01	0.26	0.39	0.65	40	0.19	0.02	5.8	5.0	4.7	---	---	---	---	---	
-3	43-68	Bw	0.07	0.04	0.01	0.00	0.12	0.88	1.00	12	0.17	0.02	5.5	4.7	4.4	---	---	---	---	---	
-4	68-107	C1	0.06	0.04	0.01	0.01	0.12	1.03	1.15	10	0.12	0.01	5.4	4.8	4.5	---	---	---	---	---	
-5	107-155	C2	0.03	0.03	0.01	0.00	0.07	0.75	0.82	9	0.06	0.01	5.4	4.9	4.6	---	---	---	---	---	
-6	155-203	C2	0.02	0.02	0.01	0.00	0.05	0.66	0.71	7	0.08	0.01	5.3	4.9	4.6	---	---	---	---	---	

See footnotes at end of table.

## ANALYSES OF SELECTED SOILS--Continued

m f - ns	Base satu- ra- tion	Or- ganic car- bon *	Electri- cal conduc- tivity	pH **			Pyrophosphate extractable			Citrate- dithio- nite extracta- ble	
				H <sub>2</sub> O	CaCl <sub>2</sub>	KCl	C	Fe	Al	Fe	Al
				(1:1)	0.1m (1:2)	(1:1)					
--	Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct
35	6	7.01	0.00	4.2	3.7	3.4	---	---	---	---	---
28	4	0.85	0.00	5.0	5.0	3.7	---	---	---	---	---
15	5	0.18	0.00	6.1	4.3	4.0	---	---	---	---	---
14	28	0.29	0.00	5.6	4.3	4.1	---	---	---	---	---
16	30	0.27	0.00	6.1	4.6	4.2	---	---	---	---	---
88	19	0.33	0.00	5.8	4.5	4.3	---	---	---	---	---
29	28	0.49	0.00	5.5	3.4	3.5	---	---	---	---	---
56	9	0.01	0.01	5.6	4.9	4.1	---	---	---	---	---
28	14	0.02	0.01	5.2	5.2	4.3	---	---	---	---	---
00	1	0.93	0.03	4.9	3.8	3.8	0.90	0.00	0.13	0.04	0.11
07	7	0.28	0.02	5.9	4.3	4.2	---	---	---	---	---
34	19	0.37	0.02	5.2	3.9	3.6	---	---	---	---	---
22	14	0.11	0.01	5.5	4.3	4.0	---	---	---	---	---
12	33	0.09	0.01	5.7	5.2	4.7	---	---	---	---	---
26	12	0.10	0.01	5.9	5.6	5.0	---	---	---	---	---
93	17	0.45	0.00	4.6	3.7	3.3	---	---	---	---	---
92	4	0.04	0.00	5.4	4.3	3.9	---	---	---	---	---
46	13	0.02	0.00	5.6	4.7	4.1	---	---	---	---	---
49	4	0.01	0.00	7.0	5.5	4.1	---	---	---	---	---
57	67	1.42	0.19	5.6	5.6	5.9	---	---	---	---	---
01	53	0.14	0.06	5.0	4.9	5.5	---	---	---	---	---
17	13	2.68	0.09	4.2	4.2	4.3	1.99	0.02	0.26	0.04	0.19
06	8	1.09	0.09	4.1	4.3	4.5	1.00	0.02	0.31	0.03	0.26
95	8	0.19	0.06	4.6	4.6	4.8	---	---	---	---	---
24	13	0.20	0.06	4.5	4.7	4.8	---	---	---	---	---
24	15	0.20	0.07	4.9	4.6	4.8	---	---	---	---	---
90	32	0.06	0.04	4.4	4.4	4.7	---	---	---	---	---

TABLE 18.--CHEMICAL ANALYSES OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Hori- zon	Extractable bases					Ex- trac- table acid- ity	Sum of cat- ions	Base satu- ra- tion	Or- ganic car- bon *	Electri- cal conduc- tivity	pH **			Pyrophosphate extractable			Citrate- dithio- nite extracta- ble		
			Ca	Mg	Na	K	Sum						H <sub>2</sub> O (1:1)	CaCl <sub>2</sub> 0.1m (1:2)	KCl in (1:1)	C	Fe	Al	Fe	Al	
			--Milliequivalents/100 grams of soil--							Pct	Pct	Mmhos/cm				Pct	Pct	Pct	Pct	Pct	
Tavares sand:																					
S82FL-55-02-1	0-15	Ap	1.96	0.55	0.02	0.04	2.57	1.26	3.83	67	0.56	0.06	5.4	5.5	5.7	---	---	---	---	---	
-2	15-91	C1	0.10	0.05	0.01	0.01	0.17	1.22	1.39	12	0.12	0.02	5.4	5.3	4.9	---	---	---	---	---	
-3	91-117	C2	0.08	0.07	0.01	0.01	0.17	1.04	1.21	14	0.07	0.01	5.3	5.1	4.8	---	---	---	---	---	
-4	117-142	C3	0.03	0.02	0.01	0.01	0.07	0.97	1.04	7	0.05	0.01	5.0	4.8	4.6	---	---	---	---	---	
-5	142-203	C4	0.04	0.12	0.01	0.00	0.07	0.62	0.69	10	0.04	0.01	5.1	4.8	4.6	---	---	---	---	---	
Valkaria fine sand:																					
S84FL-55-09-1	0-13	Ap	1.51	0.09	0.14	0.02	1.76	1.55	3.31	53	0.71	0.08	5.5	5.0	6.0	---	---	---	---	---	
-2	13-28	E1	0.32	0.02	0.05	0.00	0.39	0.41	0.80	49	0.16	0.05	5.3	4.9	5.7	---	---	---	---	---	
-3	28-41	E2	0.18	0.01	0.04	0.00	0.23	0.10	0.33	70	0.02	0.03	5.6	5.9	6.4	---	---	---	---	---	
-4	41-84	Bw1	0.49	0.08	0.11	0.01	0.69	0.59	1.28	54	0.03	0.04	5.8	6.1	6.8	---	---	---	---	---	
-5	84-130	Bw2	0.12	0.02	0.06	0.00	0.20	0.93	1.13	18	0.04	0.08	2.9**	3.6	3.8	---	---	---	---	---	
-6	130-203	C	0.26	0.05	0.10	0.00	0.41	0.40	0.81	51	0.03	0.16	4.0**	4.4	4.7	---	---	---	---	---	

\* Some of this data might be slightly outside of the properties given in table 14. The original concept has not been changed at this time because of the small amount of data available.

\*\* The laboratory pH is too low for the present range of the series. Field reaction was used in the series description.

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS

Soil name and sample number	Depth	Horizon	Clay minerals				
			Montmorillonite	14 Angstrom intergrade	Kaolinite	Gibbsite	Quartz
	<u>Cm</u>		<u>Pct</u>	<u>Pct</u>	<u>Pct</u>	<u>Pct</u>	<u>Pct</u>
Achbold sand:							
82FL-55-08-1	0-8	A	13	0	7	0	80
-4	145-203	C	7	0	10	0	83
Atatula sand:							
S81FL-55-01-1	0-20	Ap	14	35	39	0	12
-4	147-203	C	18	42	34	0	6
Basinger fine sand:							
S85FL-55-17-1	0-15	Ap	32	0	14	0	54
-4	53-76	Bh/E	12	15	10	0	63
-7	157-203	C2	13	0	75	0	12
Bradenton fine sand:							
S84FL-55-12-1	0-10	Ap	88	0	2	0	10
-3	36-74	Btg	98	0	0	0	2
-6	152-203	Ckg2	90	0	5	0	5
Chobee fine sandy loam:							
S85FL-55-20-2	8-46	A	98	0	0	0	2
-3	46-91	Btg1	97	0	1	0	2
-5	145-203	Cg	95	0	2	0	3
Daytona sand:							
S82FL-55-04-1	0-8	A	49	9	16	0	26
-3	91-114	Bh	18	19	41	0	22
-5	150-203	C	15	27	44	0	14
Duette sand:							
S82FL-55-03-1	0-15	A	13	11	62	0	14
-4	130-150	Bh	0	21	35	0	44
-5	150-203	BC	16	26	35	0	23
EauGallie fine sand:							
S85FL-55-19-1	0-10	Ap	0	0	13	0	87
-4	66-84	Bh1	40	0	16	0	44
-6	102-135	Btg	8	0	87	0	5
-7	135-203	BCg	0	0	90	0	10
Felda fine sand:							
S84FL-55-10-1	0-18	Ap	40	0	0	0	60
-5	61-91	Btg	93	0	2	0	5
-7	117-173	Cg1	91	0	3	0	6
-8	173-203	Cg2	69	0	17	0	14
Hicoria mucky sand:							
S84FL-55-16-1	0-10	A1	78	0	7	0	15
-4	53-99	Btg1	94	0	3	0	3
-6	132-203	BCg	94	0	3	0	3
Immokalee sand:							
S84FL-55-14-1	0-15	Ap	0	0	13	0	87
-4	94-152	Bh1	0	0	6	0	94

See footnotes at end of table.

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Clay minerals				
			Montmorillonite	14 Angstrom intergrage	Kaolinite	Gibbsite	Quartz
	Cm		Pct	Pct	Pct	Pct	Pct
Malabar fine sand:							
S84FL-55-11-1	0-10	Ap	0	0	0	0	100
-3	36-76	Bw1	0	9	5	0	86
-7	122-165	Btg	25	13	39	0	23
-8	165-203	Btg	0	0	77	0	23
Orsino sand:							
S82FL-55-05-1	0-5	A	27	8	8	0	57
-4*	117-168	Bw/Bh	0	24	47	0	29
-5	168-203	C	0	26	44	0	30
Paola sand:							
S82FL-55-06-1	0-13	Ap	29	12	37	0	22
-3	43-68	Bw	11	17	47	0	25
-6	155-203	C2	7	24	60	0	9
Placid fine sand:							
S85FL-55-23-2	8-28	A	21	33	19	0	27
-4	96-124	Cg2	14	36	31	0	19
-6	145-203	Cg4	7	20	20	33	20
Pomello sand:							
S85FL-55-22-1	0-10	A	33	10	16	0	41
-4	142-157	Bh	12	7	4	0	77
-5	157-203	BC	21	8	10	0	65
St. Lucie sand:							
S82FL-55-07-1*	0-15	A	20	8	9	0	63
-4**	142-203	C	0	5	6	0	89
Satellite sand:							
S85FL-55-21-1	0-10	A	42	0	23	0	35
-4	127-203	C2	10	0	6	0	84
Smyrna sand:							
S84FL-55-15-1	0-13	Ap	0	0	0	0	100
-3	38-46	Bh1	0	16	19	0	65
-7	114-142	C2	0	12	27	22	39
-8	142-203	C3	0	8	24	50	18
Tavares sand:							
S82FL-55-02-1	0-15	Ap	17	29	36	0	18
-4	117-142	C3	21	39	24	0	16
-5	142-203	C4	17	39	38	0	7
Valkaria fine sand:							
S84FL-55-09-1	0-13	Ap	17	0	4	0	79
-4	41-84	Bw1	0	0	0	0	100
-6	130-203	C	24	24	15	0	37

\* Detectable amounts of calcite.

\*\* Detectable amounts of calcite and mica.

TABLE 20.--ENGINEERING INDEX TEST DATA

[Tests performed by the Florida Department of Transportation (FDOT) in cooperation with the U.S. Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway and Transportation Officials (AASHTO). See the section "Soil Series and Their Morphology" for location of pedon sampled. NP means nonplastic]

Soil name, sample number, horizon, and depth (in inches)	Classification		Mechanical analysis*								Li- quid limit	Plas- ticity index	Moisture density**	
			Percentage smaller than--				Percentage smaller than--						Maximum dry density	Optimum moisture
	AASHTO***	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm				
													Pct	

Archbold sand:  
(S82FL-55-08)

Astatula sand:  
(S81FL-55-01)

C ----- 7-80

Basinger fine  
sand:  
(S85FL-55-17)

Bh/E ----- 21-52

Bradenton fine  
sand:  
(S84FL-55-12)

Btgk ----- 29-44

Chobee fine sandy  
loam.

A-3(0)	SP	100	100	80	4	3	2	2	1	---	NP	103	14
A-3(0)	SP-SM	100	100	96	9	5	2	0	0	---	NP	110	13
A-2-4(0)	SM	100	100	97	26	23	17	13	12	---	NP	110	15

TABLE 20.--ENGINEERING INDEX TEST DATA--Continued

Soil name, sample number, horizon, and depth (in inches)	Classification		Mechanical analysis*								Li- quid limit	Plas- ticity index	Moisture density**	
			Percentage smaller than--				Percentage smaller than--						Maximum dry density	Optimum moisture
	AASHTO***	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm				
Oldsmar sand: (S85FL-55-18) Btg ----- 54-60	A-2-4(0)	SM-SC	100	100	91	22	22	21	20	20	24	6	117	13
Orsino sand: (S82FL-55-05) E ----- 2-46	A-3(0)	SP	100	100	88	1	1	1	1	1	---	NP	100	16
Paola sand: (S82FL-55-06) C2 ----- 42-81	A-3(0)	SP	100	100	87	2	2	1	1	1	---	NP	103	14

TABLE 21.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Anclote-----	Sandy, siliceous, hyperthermic Typic Haplaquolls
Archbold-----	Hyperthermic, uncoated Typic Quartzipsamments
Arents-----	Arents
Astatula-----	Hyperthermic, uncoated Typic Quartzipsamments
Basinger-----	Siliceous, hyperthermic Spodic Psammaquents
Bradenton-----	Coarse-loamy, siliceous, hyperthermic Typic Ochraqualfs
Brighton-----	Dysic, hyperthermic Typic Medihemists
Chobee-----	Fine-loamy, siliceous, hyperthermic Typic Argiaquolls
Daytona-----	Sandy, siliceous, hyperthermic Entic Haplohumods
Duette-----	Sandy, siliceous, hyperthermic Grossarenic Entic Haplohumods
EauGallie-----	Sandy, siliceous, hyperthermic Alfic Haplaquods
Felda-----	Loamy, siliceous, hyperthermic Arenic Ochraqualfs
Gator-----	Loamy, siliceous, euic, hyperthermic Terric Medisaprists
Hicoria-----	Loamy, siliceous, hyperthermic Typic Umbraqualfs
Hontoon-----	Dysic, hyperthermic Typic Medisaprists
Immokalee-----	Sandy, siliceous, hyperthermic Arenic Haplaquods
Kaliga-----	Loamy, siliceous, dysic, hyperthermic Terric Medisaprists
Malabar-----	Loamy, siliceous, hyperthermic Grossarenic Ochraqualfs
Myakka-----	Sandy, siliceous, hyperthermic Aeris Haplaquods
Oldsmar-----	Sandy, siliceous, hyperthermic Alfic Arenic Haplaquods
Orsino-----	Hyperthermic, uncoated Spodic Quartzipsamments
Paola-----	Hyperthermic, uncoated Spodic Quartzipsamments
Pineda-----	Loamy, siliceous, hyperthermic Arenic Glossaqualfs
Placid-----	Sandy, siliceous, hyperthermic Typic Humaquepts
*Pomello-----	Sandy, siliceous, hyperthermic Arenic Haplohumods
Pomona-----	Sandy, siliceous, hyperthermic Ultic Haplaquods
St. Johns-----	Sandy, siliceous, hyperthermic Typic Haplaquods
St. Lucie-----	Hyperthermic, uncoated Typic Quartzipsamments
Samsula-----	Sandy or sandy-skeletal, siliceous, dysic, hyperthermic Terric Medisaprists
Sanibel-----	Sandy, siliceous, hyperthermic Histic Humaquepts
Satellite-----	Hyperthermic, uncoated Aquic Quartzipsamments
Smyrna-----	Sandy, siliceous, hyperthermic Aeris Haplaquods
Tavares-----	Hyperthermic, uncoated Typic Quartzipsamments
Tequesta-----	Loamy, siliceous, hyperthermic Arenic Glossaqualfs
Valkaria-----	Siliceous, hyperthermic Spodic Psammaquents

\* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.



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